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THE FOUNDRY

A TRADE JOURNAL

DEVOTED TO THE INTERESTS OF THE WHOLE FOUNDRY BUSINESS

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DECEMBER 10, 1892.

VOL. I. No. IV.

Published Monthly by THE FOUNDRY PUBLISHING CO.

DETROIT, MICH.

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HAVE YOU TRIED IT?

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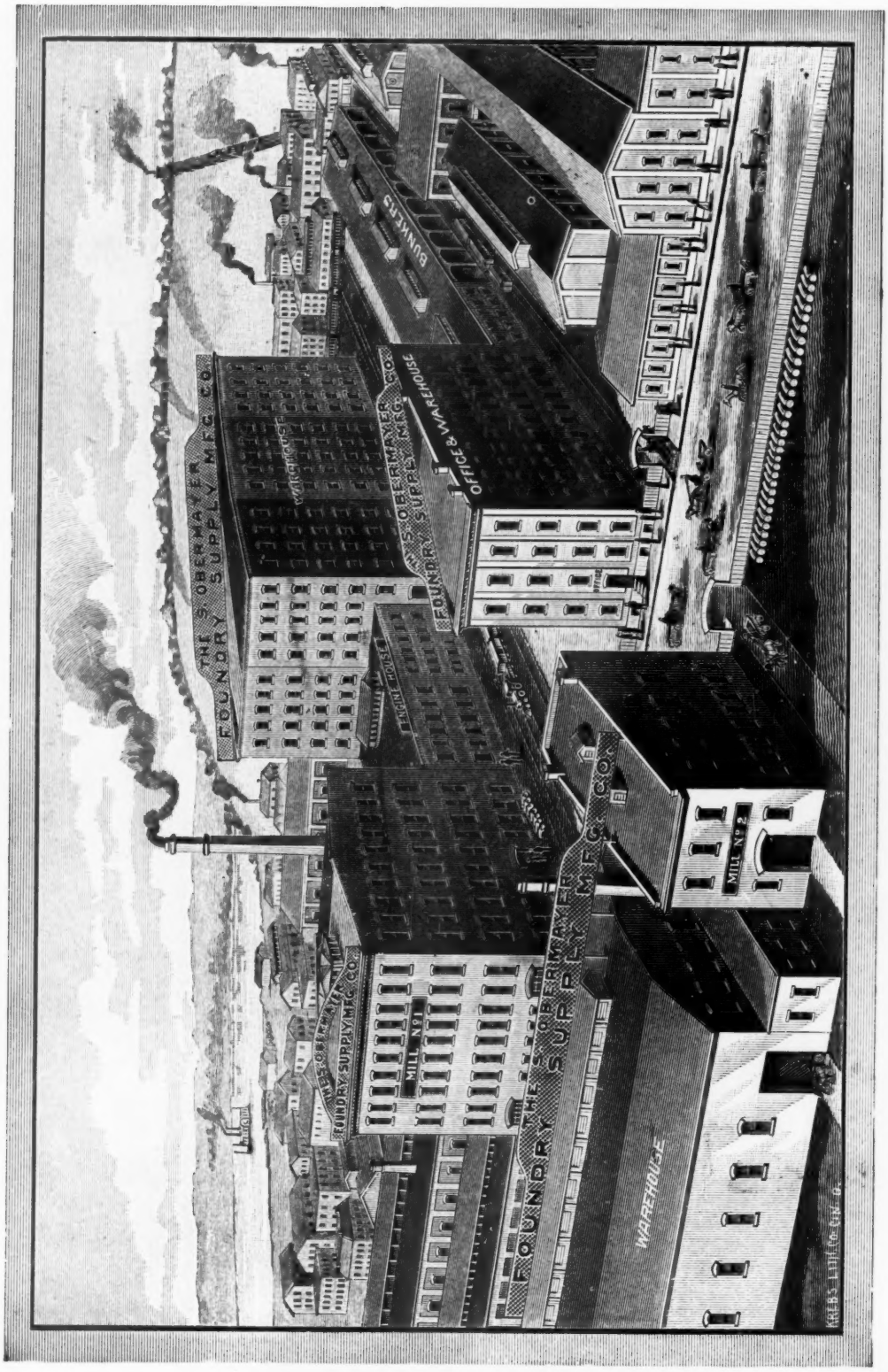
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Foundry Facings, Supplies and Equipments,

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Moulding Sand, Fire Sand and Clay.

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Cargo and Carload Shipments direct from Banks.

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FULTON AND UNION STS.
CHICAGO.
H. P. YOUNG, PURCHASING AGENT.

Nov. 28, 1892.

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Cleveland, O.

Gentlemen:--Replying to your favor of the 18th concerning your C. F. M. Founders' Perfect Wash, I have had this matter up with Mr. Ferguson, Supt. of our foundry, and, as a result, can say that we have used the Cleveland Perfect Wash for two years, and for all purposes our foreman thinks it is the best blacking he has ever used. Yours truly,

H. P. YOUNG,
Purchasing Agent.

. . . . . .

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Cleveland, O.

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McINTOSH, SEYMOUR & CO,
Auburn, N. Y.

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Cleveland, O.

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IS MADE ONLY BY

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—Manufacturers of all Kinds of—

Foundry Facings, Blackings & Supplies.

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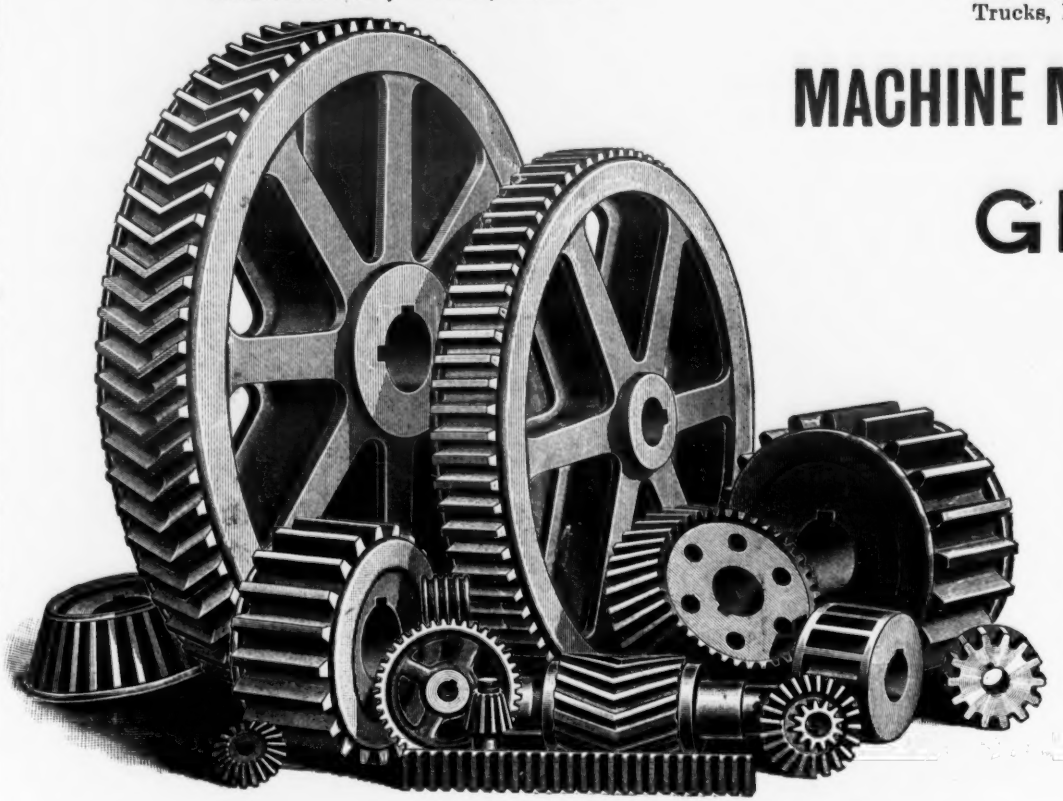
ENGINEERS, FOUNDERS and MACHINISTS,

CLEVELAND, OHIO, U. S. A.



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AND
GEARS
A Specialty.

IN Accuracy of Pitch, Definition of Form, and Smoothness of Surface, Gears produced by our Patented Machinery are beyond compare. Moreover, extensive experience and scientific experiment, enables us to make our castings of a grade of iron perfectly adapted for strong, durable, Gears. During the last ten years thousands of our Gears have been sent to all parts of the United States, and have given universal satisfaction.

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The Cheapest and Best System in Use for Lighting

FOUNDRIES,
FORGES,
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OPEN MINES,
ORE DOCKS,
MILL-YARDS.

STEAM-SHOVELS,
MACHINE SHOPS,
SHIP-YARDS,
ROUND-HOUSES,
WRECKING-PLANTS,
ETC., ETC., ETC.

"Lima-crude" or any petroleum oil (crude, refined or distilate), is sprayed by means of compressed air, and burned in that condition; yielding a clear, smokeless flame of a thousand candle power per hour on a consumption of a gallon of the cheapest oil that is accessible. At that trifling cost of maintenance, the illumination can be continued for years without half the attention that an ordinary house lamp will require. Many and various important business concerns in this country have had our system of lighting in use during the last four years and to their proprietors, we are privileged to refer.

Burners of from 300 to 3000 candle power are carried in stock, and orders within that range can be filled at once. Estimates for lighting extensive works will be made on request.

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Iron Buildings, Roofs and Trusses

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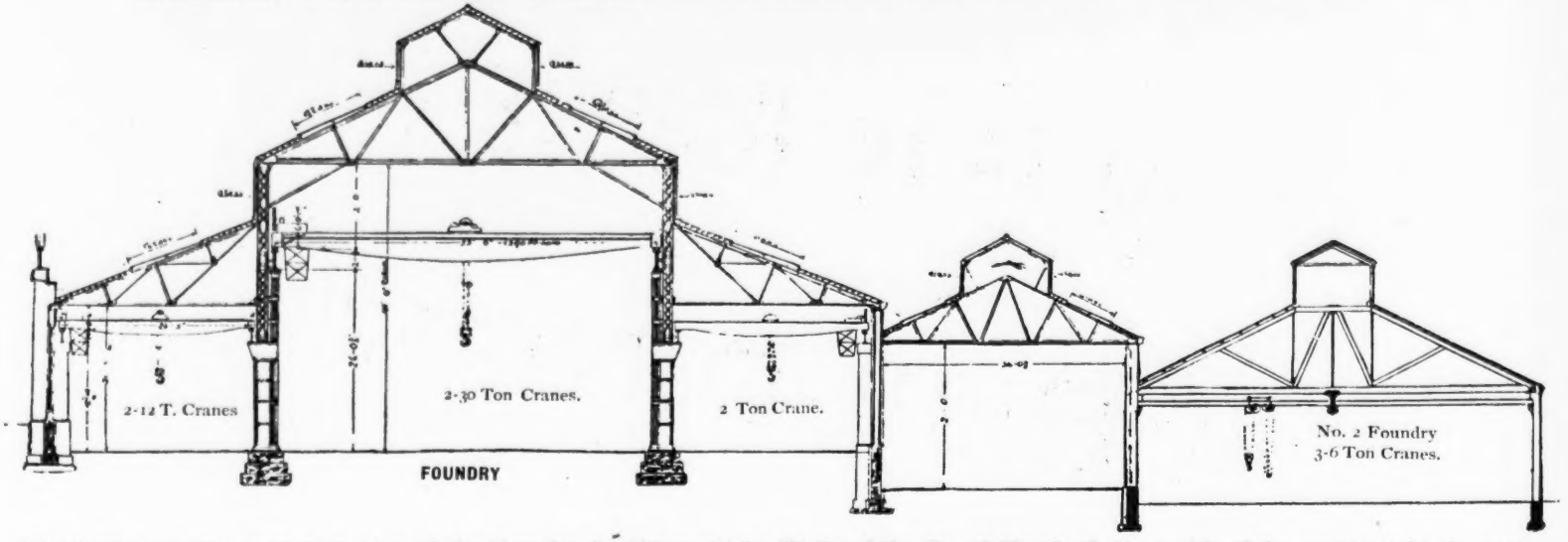
BOILERS, CUPOLAS and CRANES OF MODERN DESIGN and BEST WORKMANSHIP.



The above represents a cross section of the Foundry Buildings of the Walker Mfg. Co. of Cleveland, O. considered by experts to be the most modern and best constructed foundry in the world. Erected by us.

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BURR K. FIELD, VICE-PRESIDENT.
GEO. H. SAGE, SEC'Y.
F. L. WILCOX, TREAS.

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ENGINEERS, ARCHITECTS AND BUILDERS OF

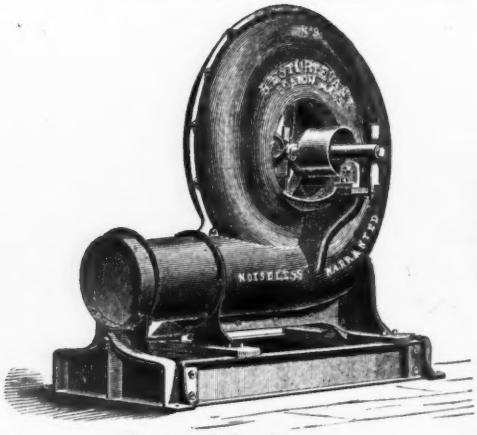
IRON BUILDINGS,

OFFICE AND WORKS:

EAST BERLIN, - - CONNECTICUT.

Send for Illustrated Catalogue.

The above illustration is taken direct from a photograph, and shows the interior of an Iron Foundry designed and built by us for The Farrell Foundry & Machine Co., at Ansonia, Conn. The building is 129 feet in width by 302 feet in length. The wings are 30 feet and 43 feet respectively, and the central portion is 56 feet in width. The central portion of the building is controlled by a hydraulic crane, with a travel the full length of the building, and is also arranged with jib cranes for delivering the material from the traveling crane to the cranes in the wing trusses.



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THE STURTEVANT STEEL Pressure Blowers,

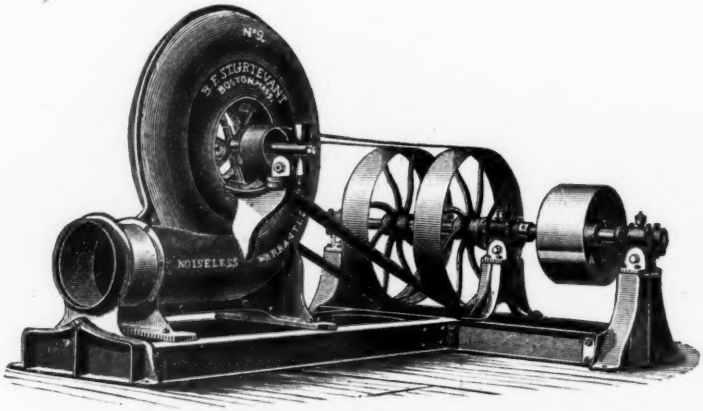
—FOR—

Cupola Furnaces and Forge Fires

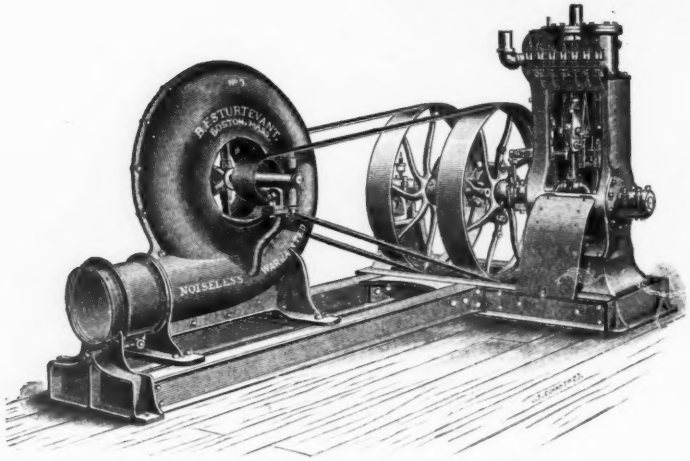
BLOWERS

Furnished without Bed with Separate Countershaft.

BLAST GATES.



Blower on Adjustable Bed with Combined Countershaft.



Blower on Adjustable Bed with Double Enclosed Engine.

BLOWERS

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Direct Connected

Electric Motors.

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STOCK CARRIED AT BRANCHES.

The Buffalo Steel Pressure Blower

FOR CUPOLA FURNACES, FORGE FIRES, ETC., ETC.

BUILT ON ADJUSTABLE BED
COMBINED WITH COUNTERSHAFT.

——ALSO WITH——

DOUBLE UPRIGHT ENCLOSED ENGINE.

BUFFALO FORGE CO.,

Send for Catalogue and Photos. **BUFFALO, N. Y.**

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Between St. Clair and Superior Streets.

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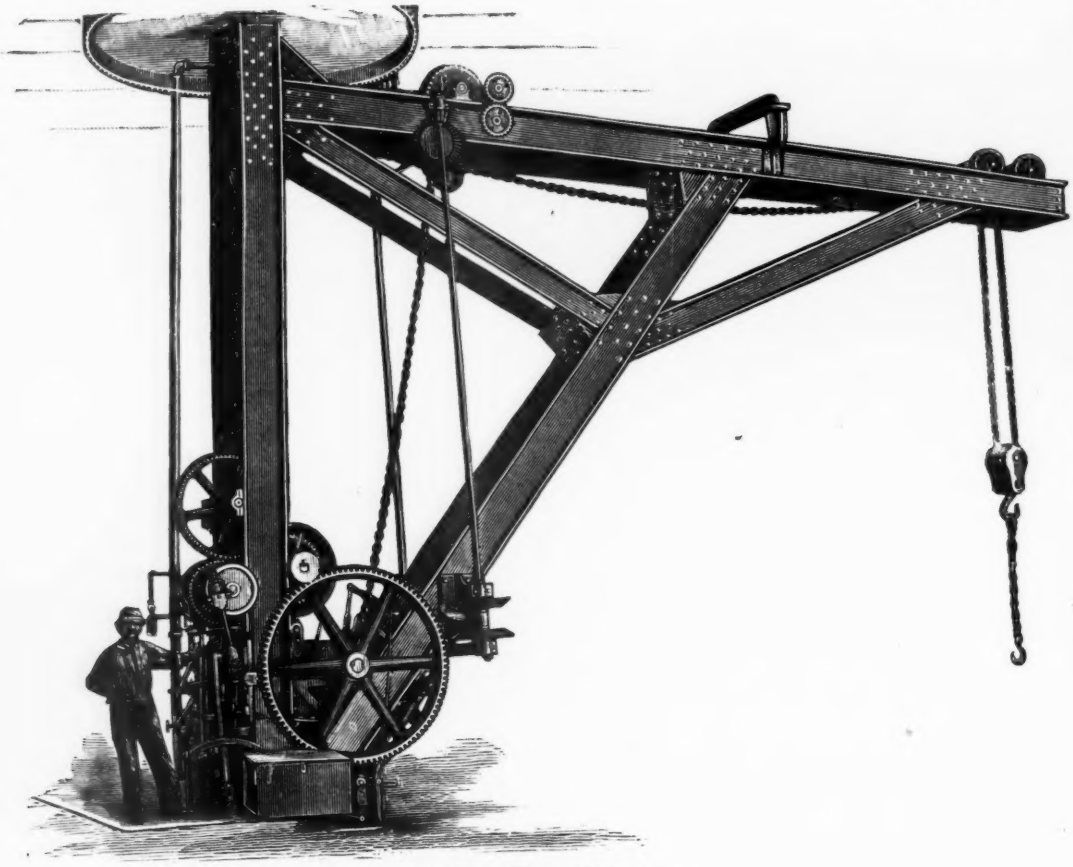

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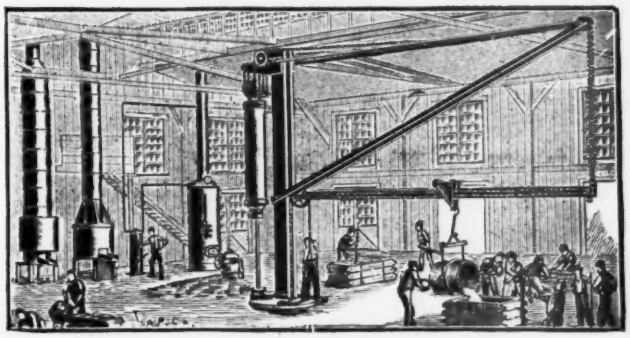
COMPRESSED AIR HOISTS. STEAM HYDRAULIC STOCK ELEVATORS.

Ridgway Balanced Steam Hydraulic Crane.



Cut shows 5 ton Crane in Foundry of Diamond State Iron Co., Wilmington, Del.

THE GREATEST FOUNDRY CRANE KNOWN.

The Latest New Foundry to Adopt this Crane is that of

GAAR, SCOTT & Co.,

RICHMOND, IND.

Who will use **FIVE** of Them.

WHY DID THEY SELECT THIS CRANE?

They went up to **FRASER & CHALMERS, CHICACO,** and saw the Crane at work in the foundry there and that settled it.

Everybody who sees this Crane at work, falls in love with it.

WHY?

Because it does the work quick. Lifts a load while other cranes are getting ready to do it. Lifts 10 tons as quickly as 10 pounds. Never gets out of order. No shocks. No jars. Requires no special operator. Every man in foundry works it. No matter how dumb or careless, can't hurt himself, work, or machine. All molders like it. Has a perfect motion. Foundries using it say it saves its cost in a year in good draws. Swings very easy. A 5-ton crane with a 3-ton load on it is in about the same condition as other cranes with out any load on them. Crane is attached to ordinary steam supply at the trifling cost of a little pipe. Uses so little steam it is never missed. In fact, in a small card we can't give one-half of its excellencies. You must write us.

In moulding Car Wheels these Cranes save their cost in a year.

Are Being Adopted by the Best New Car Wheel Works.

We Build Elevators on Same Steam Hydraulic Plan for Taking Stock Cheaply and Quickly to Cupola Platforms.

COMPRESSED AIR HOISTS.

We are the original patentees and builders of Pneumatic hoists and have made hundreds of them. We do not use our patents to exact royalties, but to protect us in the manufacture. With special facilities we build them cheaply. You will save money and litigation by buying air hoists from us.

Don't contract for Cranes, Elevators or Hoists before writing us for circulars and prices. Give steam, air or water pressure radius, height to square of building and capacity desired and we will name satisfactory prices.

CRAIG RIDGWAY & SON,

COATESVILLE, PENN.

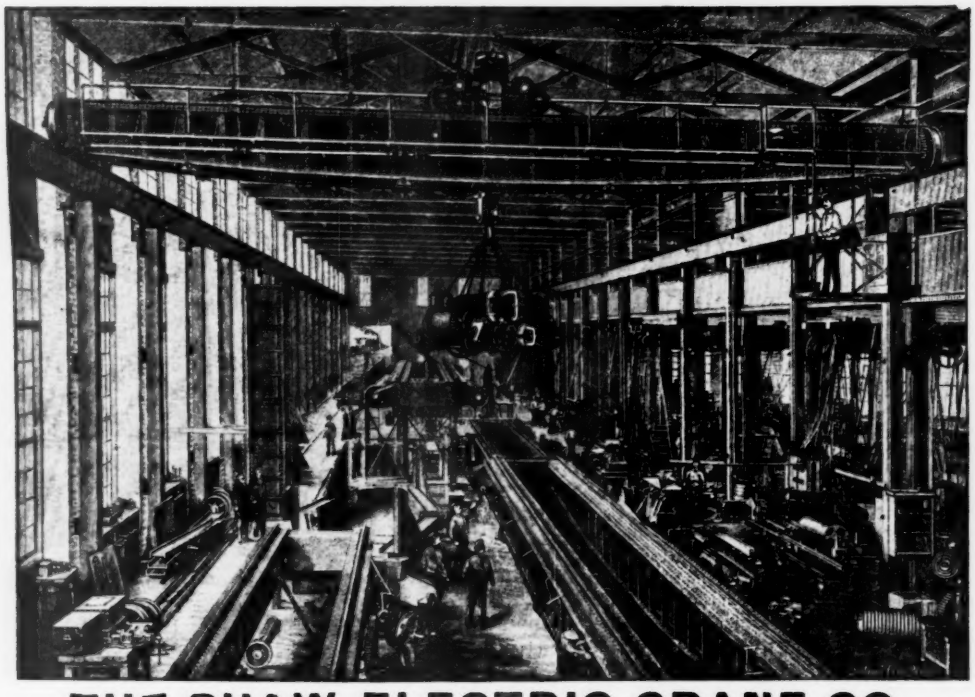
-WITH THE-

Shaw Patent Electric Traveling CRANE

Which is operated by THREE independent electric motors, you can lift from ONE to ONE HUNDRED tons WITH YOUR LITTLE FINGER, carry it to any part of the foundry and handle it as delicately as if it were but FIVE POUNDS held in your hand. With it you can lift a cope, draw a pattern or set a core as smoothly and gently as with a screw, and when clear, lift it out of the way as rapidly as you please. All the movements are under perfect control and you can run each at any rate desired, independent of all the others, between zero and full speed. You cannot drop the load through any amount of carelessness. The

PATENT DUPLEX AUTOMATIC BRAKES

hold the load up, and you cannot get it down except by lowering with the motor, and it will go down only as fast as the motor drives it. You can have all these advadtages with but one crane on earth and that is built in this shop.



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SOLD ONLY BY

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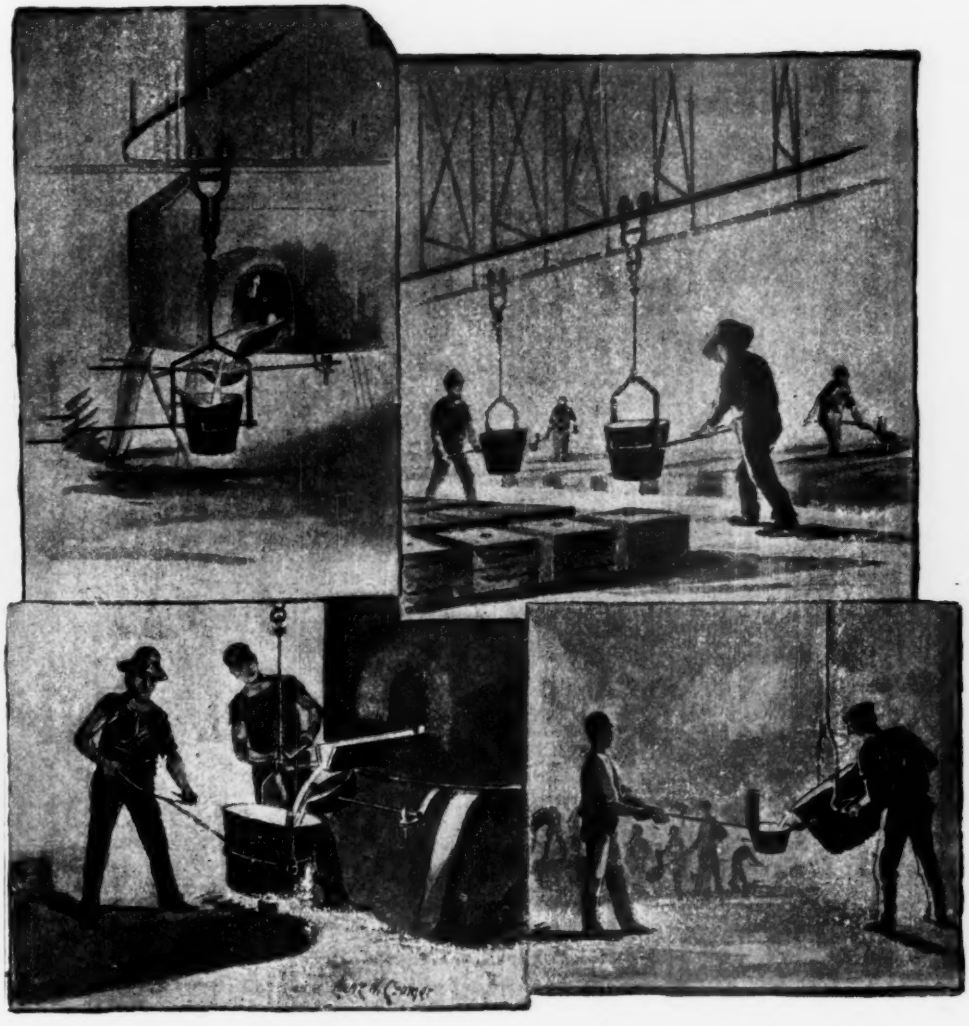
Hayes' Patent Iron Carrier.



The most complete Labor Saving device for facilitating the rapid handling of large quantities iron ever placed on the market.

Just the thing for Stove, Architectural, Car and in fact all kinds of foundries where it is necessary to have "rapid transit" of iron from cupola to mold. Will save its cost in six months in labor to say nothing of better castings, convenience and economy in material. For full information, cost, etc. Address,

LEWIS MILLER,

CARE AULTMAN, MILLER & CO. AKRON, O.

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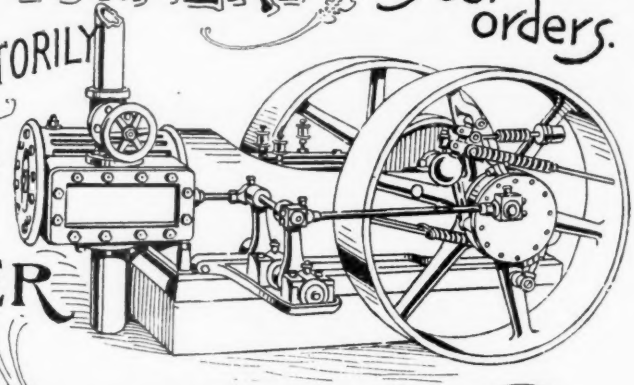
Get our Estimates before placing your orders.



We are better prepared than ever to execute Artistic and Mechanical

WOOD ENGRAVINGS.

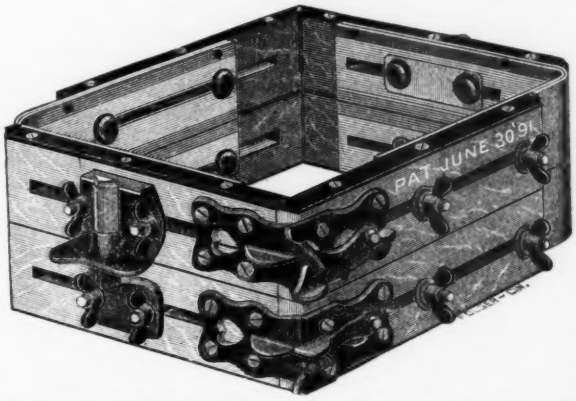
THE DETROIT FREE PRESS Engraving and Electrotype Departments.

DETROIT, MICH.

The Adjustable Snap Flask Co.,

LIBERTY, UNION CO. IND.

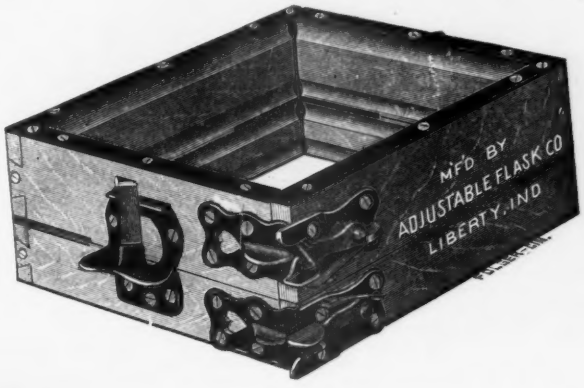
The Combination Adjustable Snap Flask.

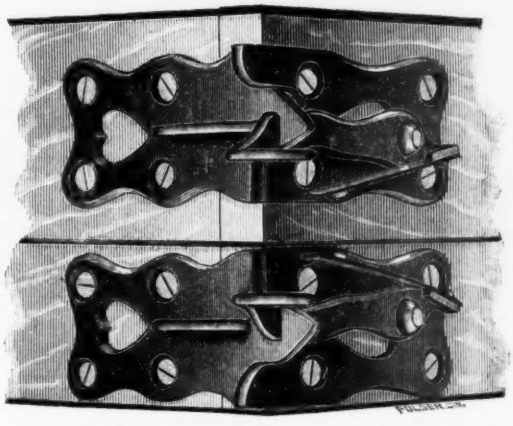


We present to you in the accompanying illustration, our new Adjustable Combination wood and metal snap flask, that can be adjusted to a variety of sizes from 9x10½ to 14x15 inches or any size between, to suit patterns used. The wood parts of the flask are the pieces to which the hinge is attached and also the parts to which the lash is fastened. The steel pieces are the inside lining of flasks. The wood and steel pieces are fastened together with bolts, and by means of a long slot we are enabled to spread the flask to any desired size. The wood parts are of ¾ in. cherry and the steel of 1-S steel. It has a spring latch which makes it very easy to open and close. It is made so substantial that it will not shift or get out of order while in use. In matching drag with cope, it makes a perfect adjustment of pins that do not shift, which supplies a long felt want in snap flasks. It will suit the molder because he uses only one flask in many sizes. It will save money for the manufacturer, as one size of our flask will answer the same purpose as several different sizes of the old style. The inventor is a practical molder and in constructing this flask has not destroyed the good features of any others, but has added many new ones. A three part flask is made to adjust the same as a two part.

TAPER WOOD FLASK.

Our new solid taper wood snap flask is made for foundries who run one size flask for a long time. The taper is made on a scale of one-quarter inch to one foot in height, allowing slip boxes to be placed over without crushing mold and still fit very tight. The flask is grooved on inside, which prevents sand from dropping out while closing. It is made of best material and workmanship. It has our new hinge and automatic spring latch.





AUTOMATIC LATCH.

Our new Automatic Latch is made of malleable iron and flat steel oil tempered spring. There is no coil spring to get out of order; When flask is closed the latch makes a solid locked corner. The latch is put on cope and drag in such manner that by pulling latches together with finger and thumb of one hand, the flask opens freely.

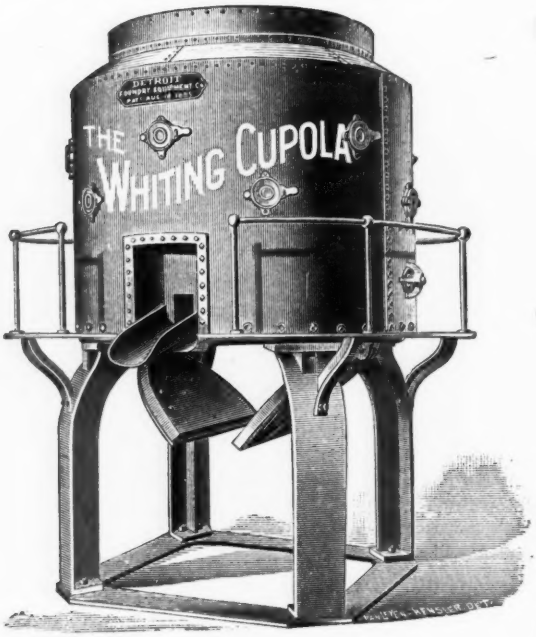
Write for Catalogue. Prices and Terms sent on Application.

Detroit Foundry Equipment Co.,

Office and Works, Michigan Ave. & D. & B. C. R. R.

DETROIT, MICH.

CHICAGO OFFICE, 62 West Jackson St. NEW YORK, 47 Cedar St.



ITS GOOD POINTS,

Economy of Fuel,
Ease of Operation,
Saving in Lining,
Rapid Continuous Melting,
Hot Fluid Iron,
Heavy Substantial Construction,
The Latest Improvements,
The Best Cupola.

Twelve Sizes. All Capacities. Send for Circulars.

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Improved Car Wheel

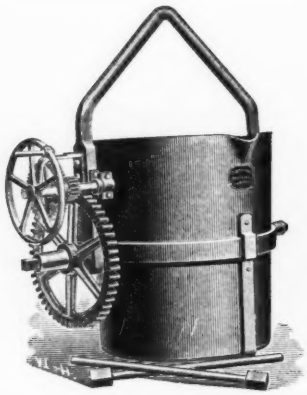
FOUNDRY PLANT.

CRANES, LADLES.

TUMBLERS,

ELEVATORS,

Sand Sifters.



TRUCKS.

COMPLETE

FOUNDRY

OUTFITS.

SEND FOR CIRCULARS.

THE FOUNDRY

VOL. I. DETROIT, MICH., DECEMBER, 1892. No. 4.

CASTINGS.

How to obtain their Measurement and Reckon their Weights, also the Nature and Qualities of the Materials used in producing them. Percentage in the Foundry. Important Facts. Formulas. Tables, etc.

BY S. BOLLAND.

Written expressly for THE FOUNDRY. (Copyrighted.)

EVERY molder should be able to reckon the weight of the casting he makes; how many of us lack that ability need not be discussed here.

Someone says, "there is no royal road to learning;" this is true indeed, and he who would obtain the ability to measure and weigh the work committed to his charge, must, at least, master as much arithmetic and mensuration as will enable him to profitably utilize the rules laid down for his guidance in these matters.

To such as are ignorant altogether of these subjects, the following short treatise on decimal fractions, and kindred subjects, will be of infinite service; for unless we know the meaning of the principal mathematical characters, the relation of vulgar to decimal fractions with some knowledge of how to work these rules, all information of importance is denied us; as almost all formulas are expressed by these signs and their solution can only be determined by correct rules.

It is not expected that even the most intelligent amongst us will be prepared for the immediate solution of every arithmetical problem that presents itself during an active life in the foundry. No matter how thorough our education may have been at the first, rules and formulas will slip from the memory, and every day's experience gives additional evidence of the truth of the old adage, that, "The key that rests, rusts." To the latter, the following reminders will, no doubt, be found acceptable at times and save an endless amount of annoyance.

The character, or sign = (called equality) denotes that the respective quantities, between which it is placed, are equal; as 1 ton = 2000 lbs. = 32000 oz.

The sign + (called plus, or more,) signifies that the numbers between which its placed are to be added together; as 9 +6 (read 9 plus 6) =15. The sign— (called minus, or less,) denotes that the quantity which it preceeds, is to be subtracted; as 15—6 (read 15 minus 6) =9.

The sign × denotes that the numbers between which it is placed are to be multiplied together; as 5×3 (reads 5 multiplied by 3) =15.

The sign ÷ signifies division; 15÷3 (15 divided by 3) =5. Numbers placed like a Vulgar Fraction also denotes division, the upper number being the dividend and the lower the divisor; as $\frac{15}{3}=5$.

The signs : :: : (called proportionals) denote proportionality; as 2:5::6:15, signifying that the number 2 bears the same proportion to 5 as 6 does to 15, or in other words, as 2 to 5 so is 6 to 15.

The sign ——— (called the bar or Vinculm) signifies that the numbers etc. over which it is placed are to be taken together; as $\overline{8-2+3}=10$. or $\overline{6\times3+5}=23$

The sign . (called decimal point) signifies, when placed before a number, that that number has some power of 10 for its denominator; .1 is $\frac{1}{10}$ .17 is $\frac{17}{100}$ etc.

DECIMAL FRACTIONS.

In Decimal Fractions, the whole number is supposed to be divided into ten equal parts, and every one of these ten parts are supposed to be sub-divided into other ten equal parts, etc.

The whole numbers being thus divided (by imagination,) into 10, 100, 1000, 10000, etc. equal parts, becomes the denominator to the Decimal Fractions; thus, $\frac{5}{10}$, $\frac{3}{100}$, $\frac{53}{1000}$, $\frac{754}{10000}$, etc.

Now these *Denominators*, are never set down, only the *Numerators*, and they are either distinguished, or separated from the *Whole Number*, by a *Point*, called the *Decimal Point*.

Thus 5.4 is $5\frac{4}{10}$, and 0.7 is $\frac{7}{10}$, 35.05 is $35\frac{5}{100}$; or 5 and decimal $\frac{4}{10}$, seven tenths, and 35 and decimal five one hundredths.

Before proceeding further in *Notation* it will be convenient for the *Learner* to consider the following table, which shows the very foundation of Decimal Fractions:

Whole Numbers.							Decimal Numbers.						
7	6	5	4	3	2	1	.	2	3	4	5	6	7
Millions.	Hundreds of Thousands.	Tens of Thousands.	Thousands.	Hundreds.	Tens.	Units.	Units Place or Decimal Point.	Tens.	Hundredths.	Thousandths.	Ten Thousandths.	Hundred Thousandths.	Millionths.

The misced number at the head of this table would read, seven million, six hundred and fifty-four thousand, three hundred and twenty one, and decimal, two hundred and thirty-four thousand, five hundred and sixty-seven millionths.

By this table it is evident that, as in *whole numbers* every degree from the *units* place increases towards the *left* hand by a *ten*-fold proportion; so in *decimal parts* every degree is decreased towards the *right* hand by the same proportion, viz., by *tens*.

Therefore these *decimal parts*, or *fractions*, are really more *homogeneal* or agreeing with *whole numbers* than *vulgar fractions*, for all plain numbers are in effect, but decimal parts one to another. That is, suppose any *series* of equal numbers, as 444, etc. The first 4 towards the *left* is ten times the value of the 4 in the *middle*, and that 4 in the middle is ten times the value of the last 4 to the right of it, and but the tenth part of that 4 on the left.

Therefore all of them may be taken either as whole numbers or part of a whole number; if whole numbers, then they must be set down without any decimal, or separating *point* between them thus, 444. But if a whole number and one part, or fraction, place a point betwixt them thus, 44.4, which signifies 44 whole numbers and 4-tenths of an unit. Again, if two *places* of *parts* be required, separate them with a decimal point, thus, 4.44, viz., 4 units and 44 hundredths of a unit, or *one*.

From hence (duly compared with the table) it will be easy to conceive that *decimal parts* take their *denomination* from the place of their *last figure;* that is, $5=\frac{5}{10}$, $.56=\frac{56}{100}$ and $.056=\frac{56}{1000}$ *parts* of a *unit*.

Ciphers annexed to decimal parts do not alter their value; as .50 and .500 or .5000, etc., are each but 5-tenths of a unit, for $\frac{50}{100}=\frac{5}{10}$., and $\frac{500}{1000}=\frac{5}{10}$., or $\frac{5000}{10000}=\frac{5}{10}$.

But *ciphers prefixed* to decimal parts *decrease* their value by removing them further from the decimal point, thus, .5=5 tenths, .05=5 hundredths, .005 =5 thousandths and .0005=5 ten thousandths; consequently the true value of all decimal fractions, or parts, are known by their distance from the *units* place, which being rightly understood, the rest will be easy.

ADDITION AND SUBTRACTION OF DECIMALS.

In setting down the proposed numbers to be added or subtracted, great care must be taken to place every figure directly underneath those of the same *value*, whether they be mixed number or pure decimal parts, and to perform that due regard must be had to the *decimal points* which ought always to stand in a direct line under each other and to the right hand of them carefully place the *decimal parts*, according to their respective values or distance from unity.

Rule.—Add or subtract as if they were all whole numbers, and from their

sum or *difference*, cut off as many *decimal parts* as are the most in any of the given numbers.

ADDITION.

Examples.—Let it be required to find the sum of the following numbers:

34.5
65.3
128.7
95.0
87.8
7.9

Answer.....409.2

When the decimal parts proposed to be added, (or subtracted) do not have the same number of places, you may for convenience of operation, fill the void places by annexing ciphers.

Without Ciphers.	With Ciphers.
45.07	45.0700
50.758	50.7580
123.0057	123.0057
74.702	74.7020
24.8	24.8000
Ans...318.3357	Ans....318.3357

EXAMPLES IN SUBTRACTION.

			Without Ciphers.	With Ciphers.
From....	437.5	75.0534	562.	562.0000
Take.....	89.657	57.875	93.5784	93.5784
Remains..	347.843	17.1284	468.4216	468.4216
From....	345.7578	345.7578	0.547893	1.000000
Take.....	.157.	157.0000	0.439758	0.997543
Remains..	188.7578	188.7578	0.108135	0.002457

MULTIPLICATION OF DECIMALS.

Whether the numbers to be multiplied are *pure* decimals or *mixed*, multiply them as if they were all whole numbers and for the true value of their *product* observe this

Rule.—Cut off; that is, separate by the decimal point as many places of decimal parts in the *product* as there are decimal parts in the multiplier and multiplicand counted together.

EXAMPLES.

(1.) Multiply 3.024 by 2.23.

3.024
2.23
9072
6048
6048
6.74352 Ans.

(2.) Multiply 32.12 by 24.3.

32.12
2.34
6936
12848
6424
780.516 Ans.

The reason why such a number of decimal parts must be cut off in the *product* may be easily deduced from these examples.

In example 1, it is evident that 3, the *whole number* in the *multiplicand* being multiplied with 2, the *whole number* in the multiplier, can produce but 6 (viz., $3\times2=6$); so that of necessity all the other *figures* in the *product* must be *decimal parts*, according as the rule directs: Or, the rule is evident from the multiplication of *whole numbers* only: Thus, suppose 3000 were to be multiplied with 200, their product will be 60000; that is, there will be so many *ciphers* in the product as there are in both *multiplier* and *multiplicand;* now if instead of those ciphers in the multiplier and multiplicand we suppose the like number of *decimal parts;* then it follows that there ought to be the same number of decimal parts in the product as there were ciphers in both factors.

Again the rule may be otherwise made evident from vulgar fractions; thus, let 32.12 be multiplied with 24.3 and their product will be 780.516, as in example 2, above. Now $32.12=32\frac{12}{100}$, and $24.3=24\frac{3}{10}$ which being brought into *improper* fractions will become $32\frac{12}{100}=\frac{3212}{100}$ and $24\frac{3}{10}=\frac{243}{10}$: Then $\frac{3212}{100}\times\frac{243}{10}=\frac{780516}{1000}$ but $\frac{780516}{1000}=780\frac{516}{1000}$ viz. 780. 516, as before. Any of these three ways sufficiently prove the truth of the above said rule, etc.

It sometimes happens that in multiplying *decimal parts* with *decimal parts*, that there will not be as many *figures* in the *product* as there ought to be *places* of *decimal parts*, by the *rule*. In that case you must supply their *defect* by *prefixing ciphers* to the *product* as in these examples.

.2365	.0347
.2435	.0236
11825	2082
7095	1041
9460	694
4730	.00081892
.05758775	

When any proposed number of decimals is to be multiplied with 10, 100, 1000, 10000, etc., it is only removing the decimal point in the multiplicand so many places to the right hand as there

are ciphers in the multiplier: Thus, $.578 \times 10 = 5.78$. And $.578 \times 100 = 57.8$. Again $.578 \times 1000 = 578$.

DIVISION OF DECIMALS.

Division is accounted the most difficult part of decimal arithmetic. In order, therefore, to make it plain it will be best to examine the chief principles of the *rule.*—

Division is the rule by which one number may be speedily subtracted from another as many times as it is contained therein; that is, it speedily discovers how often one number is contained in another, and to perform that, there are *two numbers* required to be given. One of them is that *number* which is proposed to be *divided* and is called the *dividend*, the other is that *number* by which the said *dividend* is to be *divided*, and is called the divisor. By *comparing* these two, viz., the *dividend* and the *divisor* together, there arises a third number called the *quotient*, which shows how often the *divisor* is *contained* in the *dividend*, or into what number of *equal* parts the *dividend* is then *divided.*

The *quotient* figure is always of the same value or degree, with that figure of the *dividend* under which the *units* place of its *product* stand: As for instance, let 294 be divided by 4, thus,

Divisor	Dividend.	Quotient.	
4)	294	(7	This is not 7, but 70, because the units place of 4x7 stands under the tens place of the dividend.
	28		
	14	(3	This is only 3.
	12		
Rem's. 2			Hence 72 2-4 is the quotient

Now if to the remainder 2, there is annexed a cipher, (thus 2.0) and then divided on, it must need follow that the *units* place of the product arising from the *divisor* into the *quotient* will stand under the *annexed cipher;* consequently the quotient figure will be of the same *value* or degree with the *place* of that *cipher:* But that is the next below the *units place*, therefore the quotient figure is of the next degree, or place below unity; that is, in the first place of *decimal parts,* thus, $4)2.0(.5$; so that $4)294.0(73.5$ the true quotient required.

This being well understood, division of decimals may, in all the various cases, be easily performed.

Definition.—If that *number* which *divides* another be *multiplied* with another *number* which is *quoted,* their *product* will be the *number divided.*

This definition alone, if compared with the rule for multiplication, will afford a general rule for discovering the true value of the quotient figure in division of decimals.

GENERAL RULE.

The place of decimal parts in the divisor and quotient being counted together, must always be equal in number with those of the dividend.

From this *general rule* ariseth four *cases.*

Case 1.—When the places of *parts* in the divisor and dividend are equal the quotient will be *whole numbers,* as in these

EXAMPLES.

8.45) 295.75 (35. ans.		0.0078) .4368 (56 ans.	
253 5		390	
4225		468	
4225		458	

Case 2.—When the places of parts in the dividend exceed those in the divisor cut off the *excess* for decimal parts in the quotient, as in these

EXAMPLES.

24.3)780.516(32.12		436)34246.056(78.546	
729		3052	
515		3726	
486	.534).30438(.57	3488	
291	2670	2380	
243	3738	2180	
486	3738	2005	
486		1744	
		2616	
		2616	

Case 3.—When there are not so many places of decimals in the dividend as are in the divisor, annex ciphers to the dividend to make them equal. Then the quotient will be whole numbers as in case 1.

EXAMPLES.

Let it be required to divide 192.1 by 7.684 and 441 by .7875.

```
7.684)192.100(25 ans.      .7875)441.0000(560 ans.
      153 68                     393 75
      ------                     ------
       38 420                     47 250
       38 420                     47 250
```

Case 4.—If after division is finished, there are not so many figures in the quotient as there ought to be places of decimals by the general rule, *supply their defect by prefixing ciphers to it.*

EXAMPLES.

Let it be required to divide 7.25406 by 957.

```
957)7.25406(758 or with ciphers prefixed, as per
  6 699         rule, .00758 the true quotient.
  -----
   5550
   4785
   ----
    7656
    7656
    ----
```

Divide .0007475 by .575.

```
.575).0007475(13 or .0013 the true quotient re-
     575          quired.
     ---
     1725
     1725
     ----
```

Note.—When decimal numbers are to be divided by 10, 100, 1000, 10000, etc., that is, when the divisor is a unit with ciphers, division is performed by removing or placing the decimal point in the dividend so many places towards the left hand as there are ciphers in the divisor, thus, 10)5784(578.4, 100)5784(57.84, 1000)5784(5.784, 10000)5784(.5784, etc.

It will be seen that these operations are the direct converse to those at the end of multiplication.

TO REDUCE VULGAR FRACTIONS TO THEIR EQUIVALENT DECIMALS, AND THE CONTRARY.

Any vulgar fraction being given, it may be reduced or changed into decimal parts equivalent to it, thus:

Rule—Annex ciphers to the numerator and then divide it by the denominator, the quotient will be the decimal parts equivalent to the given fraction, or at least, so near it as may be thought necessary to approach.

Examples.—It is required to change or reduce $\frac{3}{4}$-inch into the decimal of an inch.

OPERATION.

```
4)3.00(.75 ans.
  2 8
  ---
   20
   20
   --
```

The decimal parts required, that is, $\frac{3}{4}=\frac{75}{100}=.75$ inch.

Again $\frac{1}{2}=.5$, thus 2)1.0(.5 and $\frac{1}{4}=.25$, thus 4)1.00(.25.

Suppose it were required to change $\frac{1}{7}$ into decimals, 7)4.0000000000(.5714285714+$=\frac{1}{7}$.

Note.—When the last figure of the divisor (that is, the denominator of the proposed fraction) happens to be one of these figures, viz., 1, 3, 7 or 9 as in this example, then the decimal parts can never be precisely equal to the given fraction, yet by continuing the division on you may bring them to be very near the truth.

For all practical purposes in the foundry, *three places* of *decimals* are sufficiently near, the operation being considerably shortened by leaving out the rest.

When a decimal does not terminate as in the example above, the sign plus (+) is annexed, which indicates that the division could be continued.

TO REDUCE A DECIMAL TO A COMMON FRACTION.

Rule.—Erase the decimal point and write under the numerator its decimal denominator and reduce the fraction to its lowest term.

Example.—Reduce .125 inch to its equivalent common fraction.

Operation—$.125=\frac{125}{1000}=\frac{25}{200}=\frac{1}{40}=\frac{1}{8}$ inch. Answer.

TO REDUCE A SIMPLE OR COMPOUMD NUMBER TO A DECIMAL OF A HIGHER DENOMINATION.

Rule for Simple Number.—Divide by the number of parts in the next higher denominations, continuing the operation as far as required.

Example.—Reduce 1 foot to the decimal of a yard.

```
3 | 1.000
  | -----
    333+ yard. Ans.
```

Rule for Compound Numbers.—Reduce them all to the lowest denomination and proceed as for one denomination.

Example.—Reduce 15 feet $9\frac{3}{4}$ inches to the decimal of a yard.

OPERATION.

feet.	inches.	gr's.
15	9	3

12 in.=1 foot.

189

4 g'rs.=1 inch.

4 | 759.00
12 | 189.7500
3 | 15.8125

5.2708 + yards. Ans.

TO FIND THE VALUE OF A DECIMAL IN WHOLE NUMBERS OF LOWER DENOMINATIONS.

Rule.—Multiply the decimal by that number which will reduce it to the next lower denomination and point off as in multiplication of decimals.

Then multiply the decimal part of the product and point off as before. So continue till the decimal is reduced to the denomination required.

The several whole numbers of the successive products will be the answer.

EXAMPLES.

1. What is the volume of .140 cubic feet in inches?

OPERATION.

.140

1728 cubic inches=1 cubic foot.

1120
280
980
140

241.920 cubic inches. Ans.

2. What is the value of .00129 of a foot, and also the value of .015625 of an inch?

Operation.		Operation.
.00129		.015625
12 inches=1 foot		64
.01548 inches.	Ans.	62500
		93750

Answer..1.000000=$\frac{1}{64}$ of an in.

By the same rule .75 of a foot =9 inches, .25 of a ton =500 lbs., .5 of an inch =$\frac{1}{2}$ inch, .0625 of an inch =$\frac{1}{16}$ inch, etc.

(To be Continued.)

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A FOUNDRY FOR HYDRAULIC MACHINERY.

JUST a year ago last month the first heats were taken off in the new foundry of Henry R. Worthington, at Elizabethport, N. J.

From 1840 to 1891 the foundry has been a part of the Hydraulic Works, in Brooklyn, N. Y., but the increase of business demanded all the space available there for machine shops, and the foundry needed better facilities for storage and dump. It was therefore, that the foundry plant was removed to its present location, and many of the old Brooklyn foundrymen found new homes in New Jersey.

The new foundry has about 6000 square feet in use as moulding floor, exclusive of 1000 square feet of core-floor, or nearly an acre and a half apportioned as follows:

Green Sand floor,	-	40000	square feet.
Dry	" "	10000	" "
Loam	" "	10000	" "

The location and arrangement of the buildings are shown clearly in Fig. 1. THE FOUNDRY being indebted to E. H. Mumford, Superintendent of the foundry, and to the *Engineering Record*, for the details.

The foundry is lighted by twenty-four arc lamps arranged four in series on a 230 volt circuit, this voltage being chosen on account of the numerous motors and hoists supplied by the same circuits. Five more arc lamps outside light the dock and yard. The pattern lofts and repair shop, engine room and offices are lighted by about two hundred and fifty incandescent lamps, and the core-room, a separate building, 100 ft. by 100 ft., by two arc lamps and 60 incandescent lamps.

The buildings are warmed by either direct or exhaust steam, as preferred

Both green sand and loam foundry buildings are, at stated above, designed for traveling cranes, and these it is the intention of the company eventually to place in position, the jib crane shown having been fitted temporarily owing to a delay in the delivery of the travellers and the green sand foundry especially, the demands for crane service not having yet exceeded the capacity of the temporary jib cranes.

The class of work is very various, from the smallest possible up to jacketed loam cylinders, weighing twenty-two tons, including rising head, a photographic reproduction of one of which is shown in Fig. 26 as it appeared when ready for shipment to Brooklyn by lighter.

The irons used include Eastern Anthracite

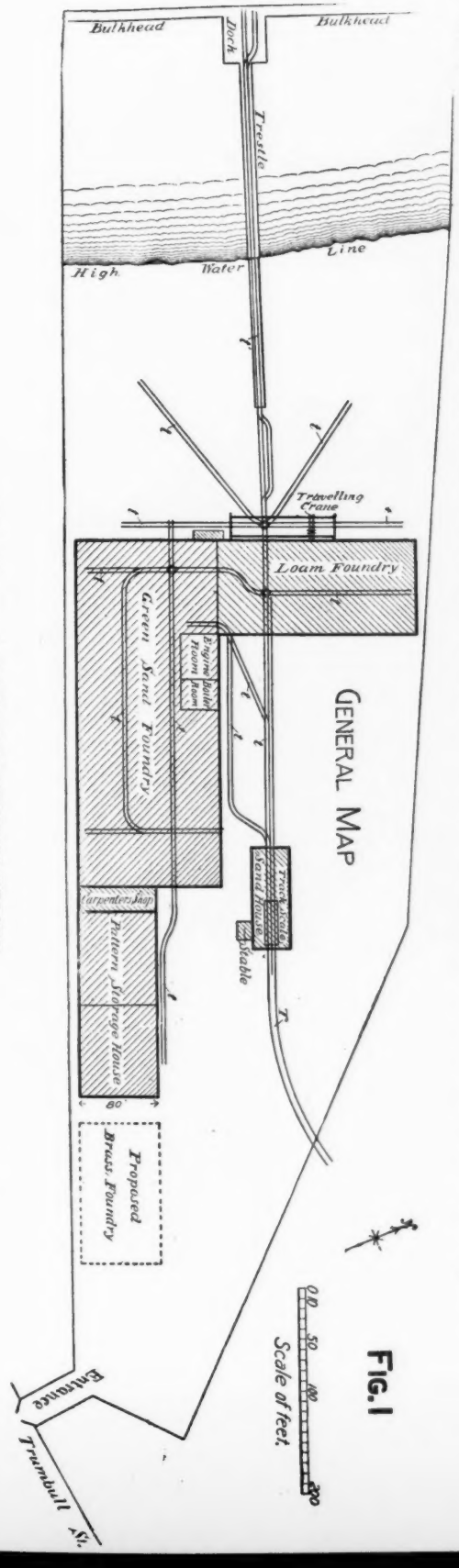

FIG. 1

and southern coke irons, as well as charcoal brands for special castings. Daily "Keep Tests" are made of the various mixtures, and, whatever the *probabilities* may be, reasoned from the analysis of the various brands, the *results* are kept where they belong, as to shrinkage, strength, and hardness.

Two 72″ Byram Colliau cupolas lined to 60. diameter are in regular service, one supplied with 11oz., the other 16oz. fan blast and melting on 30 ton heats, the one 9, the other 10 tons an hour on a coke ration of the one 8.5, the other 9.7 including the 1500 lb. beds. Limestone flux is daily ued in heats over ten tons, and the cupolas are regularly slagged.

Seven moulding machines are in constant use, and include in their product all the smaller varieties of trade pump castings up to and including steam cylinders of 12″ diameter. They are supplied with 60 lb. air and are of the type that uses the hydrostatic ramming head in lieu of the solid block.

All castings, except such as are milled, up to a ton in weight, are pickled twenty-four hours in tubs provided for the purpose and then washed with salt water from the bay.

The product of the foundry in cleaned castings—at present about 70 tons three times a week—is shipped at those intervals by lighters owned by the company, ten miles to Brooklyn, via. Staten Island Sound and New York Bay. The output is constantly increasing and it is confidently expected that in a very few years the capacity of the buildings with added appliances will be taxed to its utmost.

Figure 4 is a ground plan of the green sand foundry, and the different reference letters designate tools, etc., as follows: A A, etc., rumblers; B, forge; C C C, one 10 and two 14-ton cupolas with provision for another of 14 tons; D, hay rope making machine; E, hydraulic elevator of 10 tons capacity to cupola platform; F, sand grinding machine; G G, sand sifters; H, emery wheel; I, steam accumulator; J, auxiliary air compressor; K K K, Sturtevant blowers, L, auxiliary vertical engine; M, small press; N, main air compressor; P, pressure pumps; Q, main horizontal engine; R R, feed pumps; S, fire pump; T T T, 5x16-foot tubular boiler, 75 horse-power each; U U, etc., molding machines; V V, etc., 2-ton swinging cranes; W, two 15-ton traveling cranes; Y, a 15-ton traveling crane; O, a 15-ton swinging crane.

Figure 5 is a general cross-section of the green sand foundry. The crane tracks Z Z,

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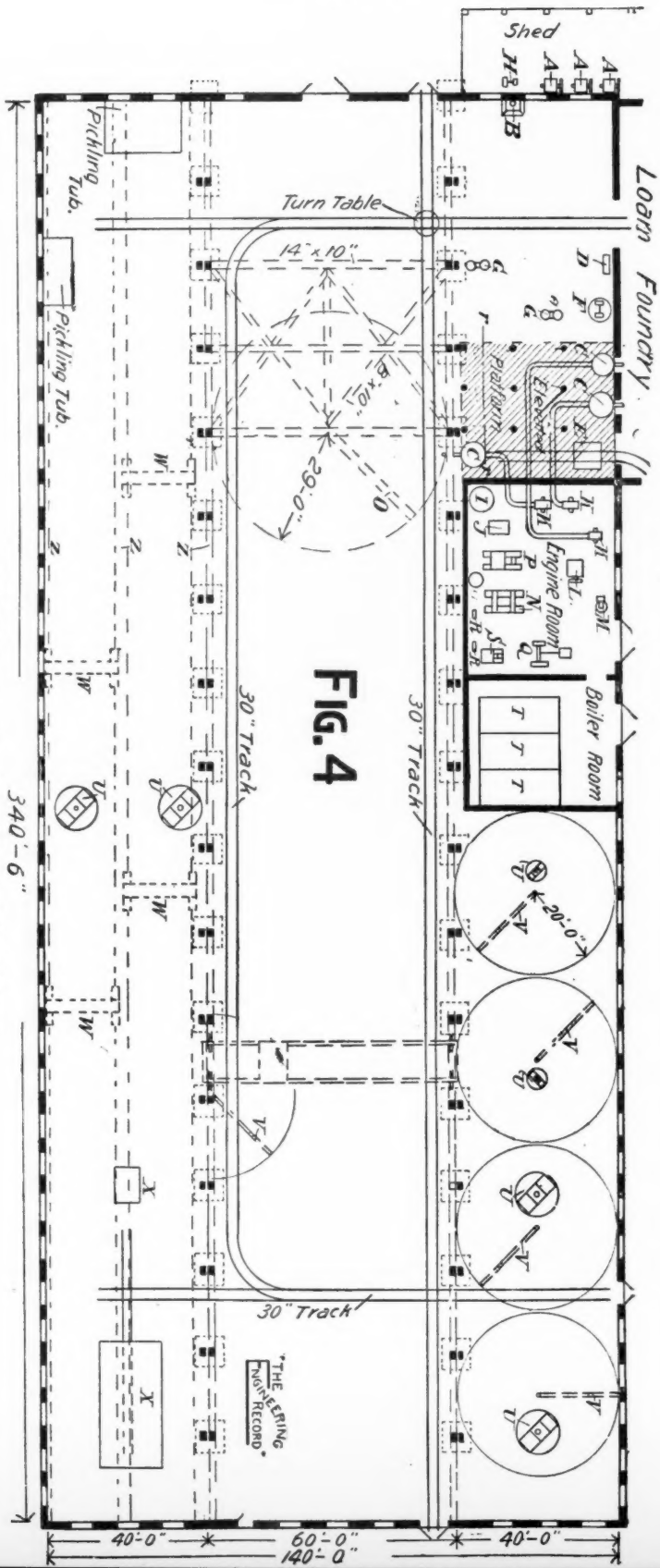

FIG. 4

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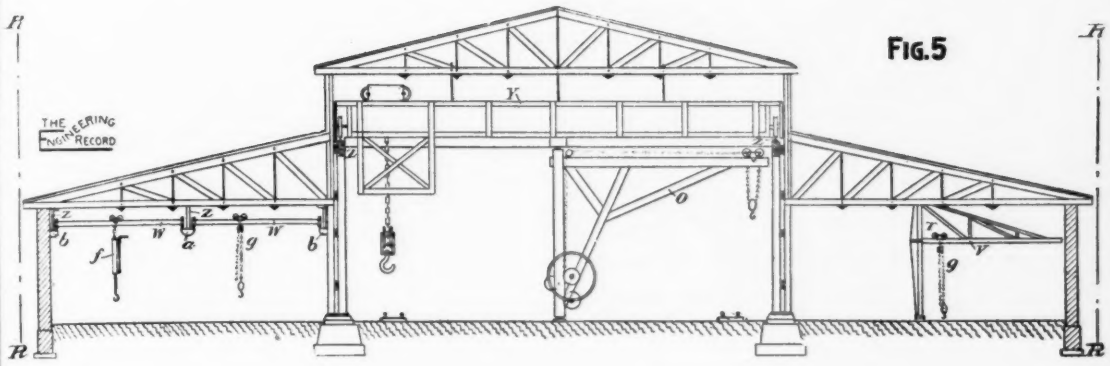

FIG. 5

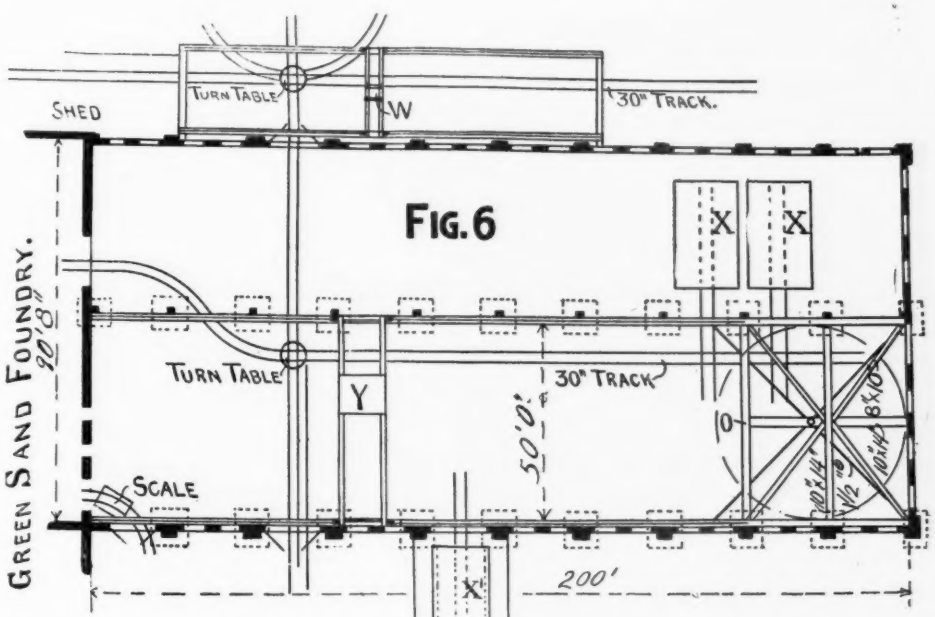

FIG. 6

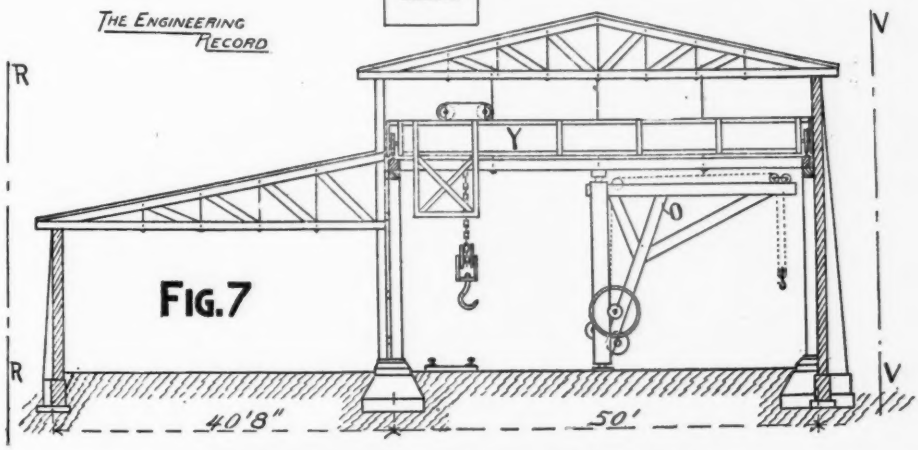

FIG. 7

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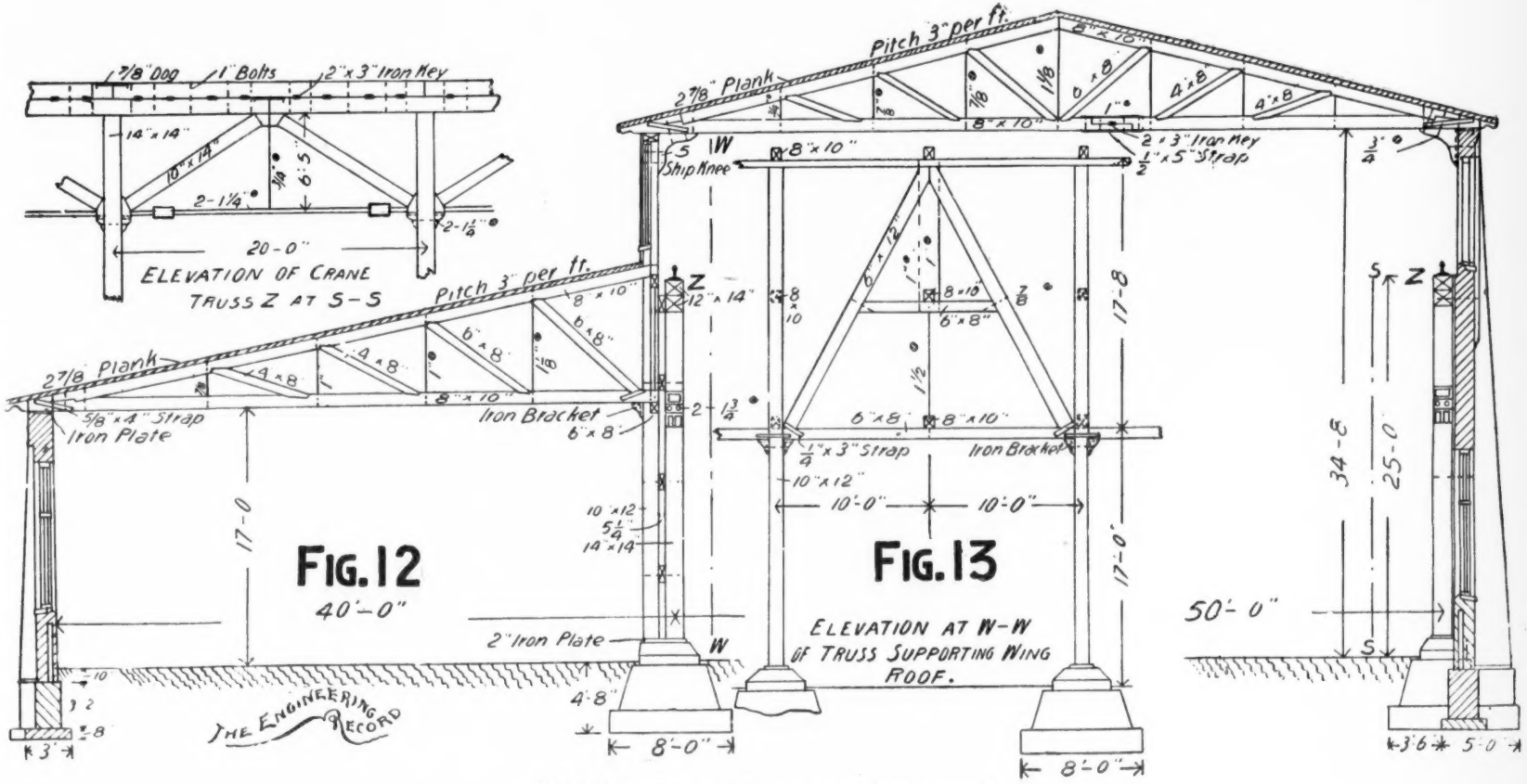

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etc., and cranes W and Y being above the section plane from which the plan, fig. 4, was

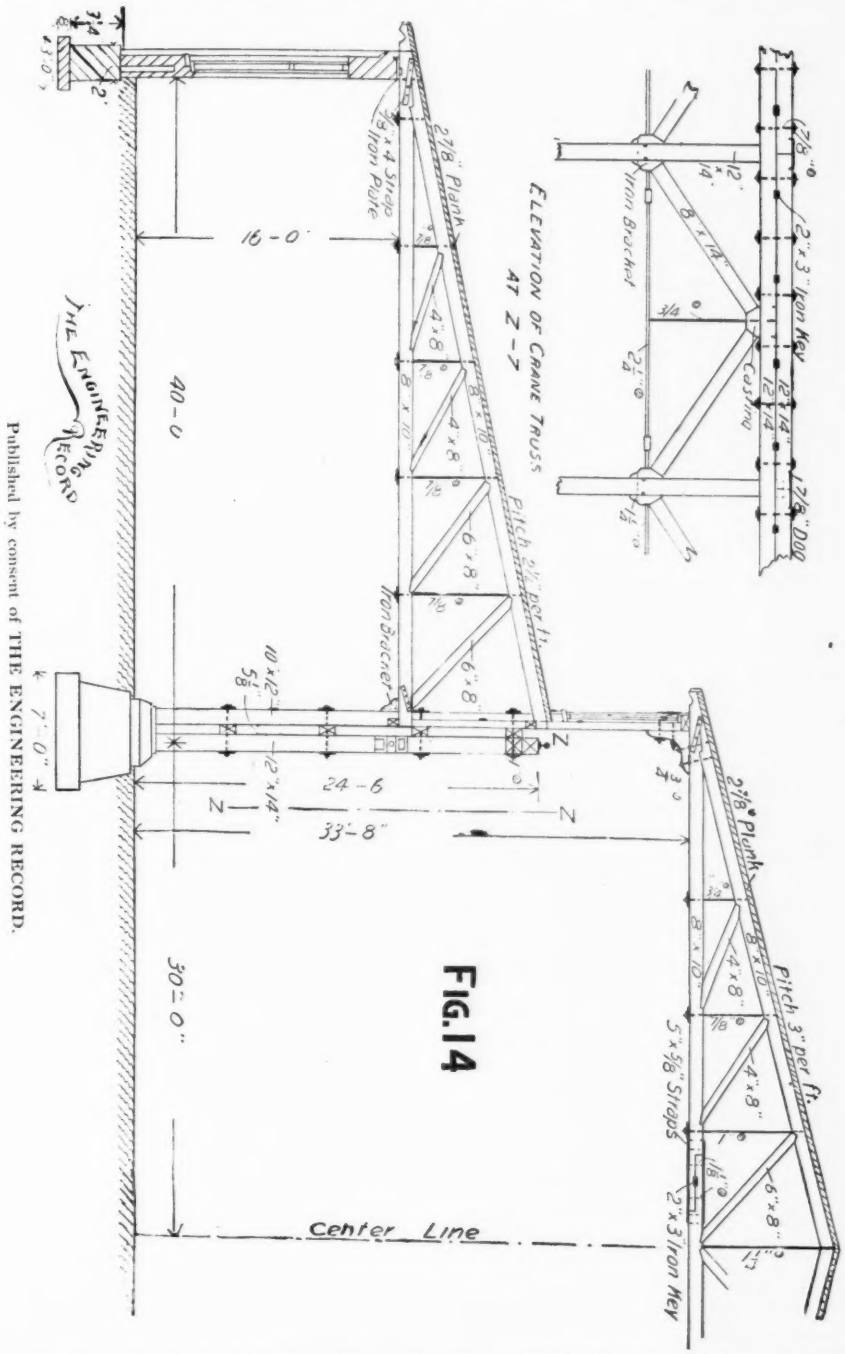

FIG. 14

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delivery extra bracing was put in, and swinging cranes O were temporarily provided, and

made, are there shown in broken lines. The building was designed for two 15-ton traveling cranes like Y, but on account of delay in their will probably be permanently retained to serve the cupolas, etc.

Figure 6 is a plan and fig. 7 is an enlarged

general cross-section of the loam foundry. X X X and X^1 are core ovens. W is a 5-ton hand traveling crane to handle large flasks, etc., outside the building. Z is an 8-ton electric traveling crane under which most of the dry sand work is done. Figures 8 and 9 are elevations to show sections of the outside walls and general arrangement of doors and windows. Figure 8 is at V V; fig. 7, and fig. 9 is at R R, figs. 5 and 7. The cupolas C C C, fig. 4, are charged from an elevated platform, shown by a shaded area on the plan, which is constructed of great strength so as to be used for the storage of several days' stock if desired. Its construction is shown by figs. 10 and 11, the former being an enlarged section at *r r*, fig. 4, and the latter a section at S S, fig. 10.

Figure 12 is a general cross-section of the loam foundry, enlarged to show dimensions and details of roof and trusses. Figure 13 is an elevation from W W, fig. 12, of one panel of the truss Q, which carries a part of the side roof.

Figure 14 is a half section of the green sand foundry, and is symmetrical about its center line. The roof and traveling crane trusses are built of best quality of yellow pine timber, with wrought-iron rods and straps and cast brackets, washers and keys. The roof is of tar and gravel on the plank sheathing. The clerestory and side windows give abundant light and ventilation, and the former can be operated from below by a shaft which opens and closes them singly or in sets. The roof trusses are designed to carry a total load of about 40 pounds of dead weight, snow and wind pressure, besides the maximum stresses possible to be transmitted to them by the swinging and traveling cranes, with maximum strains of 1,000 pounds, and 6,000 pounds for wood and wrought iron, respectively.

The plans were prepared according to data and instructions given by Henry R. Worthington, and the general arrangement and details of equipment, as fully shown in the accompanying illustrations, as well as installing the plant, was according to the design and under the direction of their own engineer.

A NEW ENTERPRISE.

THE Mexican Industrial Company has recently commenced business in Chihuahua, with a paid up capital of $500,000, and is exempt from taxes and contributions for a period of fifteen years. The buildings include a large foundry, machine shop, pattern shop, blacksmith shop, rolling mill room, stove department, nail and boltshop, etc., and all kinds of machinery are being manufactured by the company—mining machinery in particular. At the present time machinery, merchant's iron, nails, bolts, etc., to the value of $75,000 per month, are being produced at the works, the capacity of which will shortly be doubled.

SAND FOR MOLDS.

A GOOD sand should be refractory to the highest degree; it should neither crackle in contact with the liquid metal, nor set free too much gas; it should neither split nor become too compact on extreme dryness, as the withdrawal of the castings would become too slow and difficult. There are several mixtures of refractory materials, more or less plastic, capable of furnishing good casting molds for steel. The following is one formula: 52 per cent. of the debris of broken crucibles, 43 per cent. of the debris of refractory bricks, 5 per cent. of clay.

Sometimes, when this mixture is found to be too close, cokedust is added which thins it out and increases its porosity. The casting sand for steel is ground up and mixed in the ordinary manner for molds for pig. A little molasses is sometimes added to render it more workable to the hand. After the model had been removed the molds are washed over with plumbagin and then dried in a stove. When the form of the casting permits of a regular shrinking it is left to cool in the mold, but most frequently there would be risk of fractures and the removal must be at once proceeded with. The castings are thrown, while still red hot, into a furnace to cool, brought to red heat, and recooled along with the furnaces. By operating in this way fractures are almost always avoided.

The ambitious molder who aspires to become a thorough master of his trade in the higher branches should combine with his shopmates in forming a club of subscribers at the earliest moment.

THE FOUNDRY

A TECHNICAL JOURNAL DEVOTED TO FOUNDRY INTERESTS.

Published Monthly by

"The Foundry Publishing Co."

172 Griswold St. DETROIT, MICH.

DETROIT, DECEMBER 10TH, 1892.

J. M. MACFARLANE, - - - - - PRESIDENT.
S. E. WHITNEY, - - - - - - VICE-PRESIDENT.
JOHN A. PENTON, - - - - - SEC'Y-TREAS.

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SUBSCRIBERS can have address changed as often as desired.

IF YOU FAIL to receive your paper promptly, please notify us.

THE FOUNDRY is issued promptly on the tenth of each month, and will spare no endeavor to furnish valuable news and information to those interested professionally or incidentally in molding, melting, mixing of metals, foundry management, etc. Persons connected with any of these lines of industry will confer a favor upon the Editor of this Journal by sending him news from their section of the country pertaining to the foundry interests, particularly individual theories and experiences of practical value.

The Detroit News Company,

Publishers' Agents, Detroit, Mich.

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NOTHING SUCCEEDS LIKE SUCCESS.

WITH this issue, THE FOUNDRY at one jump adds twenty-eight pages over the November number and is just double what it was in September and October. We think it is unnecessary to say anything further, as nothing we might write could add in any way to the evidences of substantial success that must be apparent to every reader. The increase in size is a permanent one, and not only that, but other changes can be looked for in the immediate future that will still further enhance its value and popularity.

ATTENTION.

Dealers in Foundry Supplies.

THIS is an age of centralization, combination and organization, or all three, because all the terms have a similar meaning. We are surrounded on all sides by evidences of the benefits to be derived by association of those who have similar interests. It is unnecessary for us to furnish examples or give instances of this, almost every profession, business or calling in the country is represented by some organization of its members which enables them to become acquainted with each other, discuss subjects to their mutual advantage, and perfect plans whereby their individual interests may be served. As we write this, we think of many ways in which such an association would be of the greatest benefit to the very large number of concerns in this country engaged in the business of manufacturing and selling foundry supplies, cupalos, cranes, ladles, facings, molding sand, tumbling barrels, crucibles, fire-brick, coke, pig-iron, blowers, etc., and we are convinced that the time had arrived when something ought to be done in this direction. It might have the effect of putting a stop to the ruinous competition that has existed during the past few years in some lines and which has only resulted in a cutting of prices that has compelled the production of inferior goods. Much of the enormous expense that is now incurred might be avoided if a better feeling existed and the interests of the customers as effectually served. We only throw out the suggestion, eventually self-protection will compel its adoption and the sooner it is done the better for all.

NO CAUSE FOR APPREHENSION.

THE *Detroit News* has been interviewing some of the leading pig-iron dealers on the possibility of the iron market being seriously effected by the election just past, and judging from the published interviews there does not seem to exist in the minds of local dealers any cause for anxiety, as they seem to think that not only will prices not be affected, but in addition as good sales can be looked for, as have marked the past season.

Lee Burt, an extensive dealer, admits that there is no possibility of any tariff changes effecting the charcoal irons for the season that little or more is made outside of the United States. F. B. Stevens, another well-known dealer, points to the fact that southern pig-iron has, since the election, increased in value fifty cents a ton and also that the southern iron practically fixes the price of other irons, as much as 85 per cent. of the iron sold in the great iron-producing state of Michigan coming from the South. Others interested in the pig iron trade express similar views. THE FOUNDRY is of the opinion that the uncertainty caused by the change of administration may be a blessing in disguise, as having the effect of putting manufacturers on their guard and by that means preventing over-production, which, if recklessly indulged in, could result more disastrously than any likely tariff changes.

IT IS YOUR DUTY.

THIS country has recently passed through a presidential campaign, remarkable in some ways as having been conducted with less bitterness than have any of its immediate predecessors and without any of that personal animosity which has characterized some late presidential elections. The issue was, to a certain extent, one effecting the national policy on the tariff question, and has apparently been so conceded by both victors and vanquished, and while other considerations entered largely into it, yet all seem disposed to attribute much, if not the main portion of the verdict, to the people's decision on the tariff. With the correctness of this verdict or the justice of these conclusions, we have nothing to say.

THE FOUNDRY has plenty of elbow room to work in and become a most successful paper without permitting political questions to distract its attention, but we feel it imperative at this time to go on record as declaiming it to be the duty of every honest man to do nothing to discredit our national prosperity or foster a feeling of alarm in the minds of the people. If a change is to be made that is going to be far reaching in its effects, it should be remembered that the party making that change contains many men of great ability who are going to have the benefit of the wisdom of those of the opposite party and we do not, for a moment, believe that anything is likely to be done that will work serious injury to any of our public or private interests.

Nothing is, or could be more worthy of condemnation than any attempt to create national distrust and the man who wilfully engages in such guerilla work is a Benedict Arnold in disguise. Let us put our country before considerations of a partisan nature and remember that a political party or its platform, in this land of free ballots and frequent elections, can never bring serious injury to the common wealth.

GONE WITH THE COMET.

FOR some reason or other there has always existed in this country an impression that has become well-nigh universal to the effect that foundrymen and those engaged in foundry pursuits or connected with foundry enterprises were far behind all others in having a nineteenth century respect for the theoretical and scientific sides of their business, as well as for its practical side.

To such an extent has this idea grown and been fostered, that some men, otherwise in all things liberal and intelligent have been wont to disparage the intelligence and ambition of this body of men as a class and to discredit or belittle anything that might be attempted to either prove the contrary or improve existing conditions. To what extent this may have been the case in by-gone years, we know not, but during revolution in this respect which has so increased in volume that at least half a dozen prominent trade journals in this country find occasionally space in their columns to publish something with reference to the foundry interests, the most of them having swung into line inside of not more than four years, and all of them are more or less anxious to secure original matter of a technical or practical nature when possible. They have found it to pay, hence their action in that respect. But it has remained for the advent of THE FOUNDRY to deprive the last of these croakers of a good

portion of their vocation and overwhelming evidence is at hand to not only dispel the impression, or more properly speaking, the superstition referred to, but to convince the most skeptical that there are thousands of men connected with the foundry business in this country who are actually eager to improve the knowledge by every possible means. THE FOUNDRY has been in the receipt of hundreds of encouraging letters from all parts the continent and our subscription books bear evidence of a degree of prosperity that we believe has never been equalled in the history of American trade journalism, while advertisers have eagerly grasped the opportunity to reach directly those upon whom they depend to purchase their goods. The foundry business has a distinct importance and individuality of its own, which hitherto has never been recognized but which is bound to assert itself in spite of those narrow individuals, (many of whom desire to profit from it) who deny the possibility of their being benefited by a study of the experiences of others or an intimate knowledge of the improved methods or appliances being constantly introduced. These theories are now a back number and only dare to show themselves where the mists of ignorance are thickest, while they, themselves, are fully as modern as an Egyptian mummy.

FOUNDING AND METALLURGY.

As Practiced in the Early Part of the Last Century.

Continued from November.

Translated from Reaumur for THE FOUNDRY by N. DANTERVILLE.

I MIGHT describe at once the compositions which seemed best to me and say that I give them as such only after endless experiments; but why should they believe me, if I do not tell what are the experiments which I made? for after all, it is only by these united experiments that we can prove that the preference which we give to certain compositions is well founded; they show the road that we have followed, they will consequently show, if we have tried all that which could be tried with some probability of bringing steel to the highest perfection.

Besides, if we have omitted some experiments that some one thinks should not be neglected, they will undertake them with so much more assurance that there will yet be nothing decided against their success.

We can not dispense of commencing by giving a hurried idea of the manner in which the necessary materials to operate the conversion of iron to steel, are employed. Commonly they have boxes or large square (creusets) in which they exclose the bars of iron which they wish to change to steel, some have these boxes or (creusets) made of sheet iron and others have them made of cast iron, in place of (creusets) some have ovens purposely constructed where they can place longer bars. Which ever is used, after having cut the bars of a length proportional to that of the capacity where they wish to place them, they bed them, they arrange them by layers which are separated one from another by other layers made of the composition suitable to change them to steel. The (creusets) being filled, they cover them, they lut them and they give them a violent fire more or less long, according to the quantity and thickness of the iron which they enclose, it is this which will be explained in the other memoirs; what we have just said suffices for the understanding of this one. It was necessary to make some experiments to discover the effect which different matters produced on the iron separately, or mixed together in different proportions, which should envelope the fire while it was heated by a fire of a force and of a length suitable, to do this I commenced by having made numbers of small (creusets) of earth, square or oblong. All the (crusets) of the same batch were equal and alike; I enclosed in each (crusets) some pieces of iron of the same quality, equal in weight and in all dimensions. I gave them a fire the most equal that was possible. I surrounded the iron of each (crusets) with a different material or with a mixture of different materials; it was then solely to the difference in the materials that must be attributed the difference of the changes made in the iron, since other wise all the rest was equal. I

often used (crusets) which would contain only half a pound or even a quarter of a pound of iron with the composition which was necessary to envelope it.

By what means I had the facilities to expedite thirty to forty essays in a single batch in a quite small furnace.

If I had wished to commence by great experiments the funds of a rich state would hardly have sufficed for all those experiments which I found necessary. I will also remark in passing, that the greater part of those who have attempted to convert the iron of the Kingdom (France) to steel, have failed by wishing to commence to work on too large a scale; it seemed to us that some of them had the main parts of the secret, but before knowing what ought to be added to it or subtracted from it, because of the nature of the iron to which it was applied or because of the construction of the furnaces which they were obliged to use, they have always wished to commence by converting at once a great quantity of iron; their first attempts cost them so much that before they could get to make all those trials which were necessary to rectify the dose of their composition, they had exhausted their little fortune and all the resources which they could get from those who were associated with them.

I commenced by trying eight different compositions: The baths (trempe en paquet) of preparation had given me the idea of some, to them I joined others that I found in print and one that M. D'Angervilliers, attentive to the good of the Kingdom, (France) had learned in Germany where his superintendence at Strasburg placed it in his reach. The success of this first experiment was, at least, as great as I expected; the iron in all my (crusets) after 59 hours in the fire, were more than half changed to steel; set again in the fire a second time, and during an equal period they became so entirely.

It is true they were not steel such as I sought; some were too coarse, others were hardly more hard than iron, some few were fine and hard, but they could not stand the hammer, it would have been impossible to work them.

It was, however, enough to show me that I was on the right road, but that it was necessary to disentangle that which was missing in some of my compositions and what was too much in others; in fact, that it was necessary to decompose each to know the effect of each of their materials, and that I would afterwards arrive to combining these different materials in different proportions. But to leave nothing untried and to go as far as was possible, I thought that I ought to commence by discovering if the iron which has been heated a long time and violently without being exposed to the immediate action of the flame, of that itself would not acquire the qualities of steel. If the duration of fire itself had not produced a part of the changes which I observed. To be enlightened I enclosed some pieces of iron in divers (crusets) when I surrounded them only with matters in sipid, or nearly insipid; some were enclosed in potters earth like that of which the (crusets) were made, others with common lime, others with plaster, others with powder of calcined bones, others with different kinds of sand, others with lye, ashes and finally others with pounded glass. All these trials taught me that the fire was not capable of converting to steel the iron which was surrounded only with materials too earthy and almost insipid. Many of these materials, nevertheless, produced on the iron different effects which seemed to me deserved to be remarked and which might have their uses. Ordinary lime, for example, the lime of bones or calcined bones far from giving to the iron any disposition to become steel, only made of it an iron more soft to the file and to the hammer, and it is an observation of which in the following pages we will make some use which, perhaps nearly equals that of converting iron to steel.

(To be Continued.)

Your paper is a thing much needed among Foundrymen now and for many years passed.

ROBT. CAMPBELL, Treas.
Gladsden Foundry and Machine Works,
GADSDEN, ALA.

According to promise I send you a list of twenty-four subscribers to the FOUNDRY, which I think ought to be encouraged.

THE FOUNDRYMENS' ASSOCIATION

THE first annual meeting of the Foundrymen's Association was held on Wednesday evening, November 2, 1892, at the Manufacturers' Club, Philadelphia, Francis Schumann, the President, in the chair. There were present, of the Philadelphia members and guests, the following: Francis Schumann, Tacony Iron and Metal Company; Walter Wood, R. D. Wood & Co.; Ed. Bureau and Eduard Bureau, Bureau Bros., Justice Cox, Jr.; H. C. Vansant, Morris, Tasker & Co., Limited; E. E. Brown, E. E. Brown & Co.; Josiah Thompson, I. S. Cassin & Co.; W. N. Barrows, G. S. Emerick & Co.; P. Kearns, Stuart & Peterson Company; Thomas Glover, Glover Bros.; Stanley G. Flagg, Jr., Stanley G. Flagg & Co.; Howard Bing, James Bing; Arthur W. Howe; C. R. Baird, Chamberlain Turney & Baird; D. J. Matlack, I. P. Morris Company; Ralph H. North, North Bros. Manufacturing Company; Chas. T. Holbrook, Juniata Furnace and Foundry Company; J. Sellers Bancroft, Wm. Sellers & Co., Incorporated; Wm. Adams and W. H. Hunt, Wm. Adams & Co.; Thos. Hobson, *The Iron Age;* Henry Ruhland, Henry Ruhland & Co.; Wm. Wark, Dienelt & Eisenhardt; John Birkinbine; Theo. B. Rohrman; A. C. Mott and W. H. Pfaehler, Abram Cox Stove Company; H. W. Butterworth, H. W. Butterworth & Sons; A. B. Paxson, H. M. Bougher and Howard Evans, of J. W. Paxson & Co. There were present also from other cities: Robert J. Register, J. Register & Sons, Baltimore; E. E. Durant, G. F. Warner Manufacturing Co., New Haven, Conn.; P. D. Wanner, Mellert Foundry and Machine Co., Reading, Pa.; T. B. Harkins, T. B. Harkins Foundry Company, Bristol, Pa.; W. H. Green and W. H. Green, Jr., Vulcan Works, Chester, Pa., Edward Betts, Betts Machine Company, Wilmington, Del.; John Hanes, Woodstown, N. J.; H. M. Kolb, Lansdale Iron Works, Lansdale, Pa.; W. H. Fairlamb, Harlan & Hollingsworth Co., Wilmington, Del.; John D. Newbold, R. S. Newbold & Son, Norristown, Pa.; George A. Messick, Pusey, Jones & Co., Wilmington, Del.; Alfred D. Poole, J. Morton Poole Company, Wilmington, Del.; C. Kirchhoff, editor *The Iron Age*, New York; H. F. Pickels, Wilmington Pipe and Foundry Co., Wilmington, Del.; E. M. Mumford of Henry R. Worthington, Elizabethport, N. J.; J. W. Todd, Diamond State Iron Company, Wilmington, Del.; Alexander W. Fyfe, of Bell & Fyfe Foundry Company, Brooklyn, N. Y., and others.

PRESIDENT'S ADDRESS.

THIS, the first anniversary of our association, is a fitting occasion for a retrospect of the reasons for its formation, its progress and an expression of views of what is essential toward its efficiency in promoting our mutual welfare.

In the course of the last few years the condition gradually developed that the foundry industry was suffering from abnormal competition, resulting in serious depressions in the price for their product.

A growing spirit of reserve—distrust, if not animosity—between foundry operators, due probably to the rapidly changing conditions in modes and methods of competition in recent years, tended to separate them and keep them apart.

In no kindred industry was there so little intercourse. Whilst their employees were fraternizing and exchanging views relating to their mutual advancement and protection, the operators persisted in a rigid, suspicious behavior to one another.

They heard of each other's doings through their employees or customers only, who, having solely their own interest at heart, soon discovered how to advantageously utilize this feeling of distrust and want of harmony.

Only one result could be expected from such a condition—a condition existing at a time when, in our country at least, we were undergoing an adjustment between production and consumption so critical that only by the exercise of concerted action could prices be maintained in allied industries.

The foundrymen availed themselves of no such safeguards; they battled singly and alone, bitterly complaining of one another because of the continual cutting of prices, which was lessening his profits more and more.

The future looked gloomy. Why was this so? Exercising all his energy, experience and economy, he could not exist at the prices paid for his product.

Whilst other industries were subject to this same adjustment of supply and demand, they still maintained prices that were, under the circumstances, satisfactory.

While the wages paid by fouudrymen were

the same, or nearly so, as in previous years when profits were better, they were not more than those paid by allied industries. The cost of raw materials was even less than in the more profitable years.

The anxiety for the future and a dawning knowledge that by concerted action only could serious results be averted finally brought us together and led to the formation of this association—an association which, let us hope, will continue to exist as long as iron is melted.

We have come together to foster and promote mutual respect, friendship, reliance and confidence, which are the elements necessary toward that unity of action required for our general welfare.

So far the results have been most satisfactory. We are making converts rapidly; our membership roll has been greatly augmented; applications for membership are presented at nearly every meeting, and we have representatives in all sections of the country. The most serious doubt—that of numerical strength—has been dissipated.

The purposes of this association being the advancement and protection of our interests, the most vital of which is the maintenance of prices, we naturally look for the causes interfering therewith. Summarizing them, we have: The gradual evolution of the foundry as a producer of castings only, distinct and separate from any other industry; their rapid growth in numbers, lack of cohesion as an industrial body, and consequent weakness to maintain prices.

The absolute lack of any code of practice, either written or unwritten, qualifying and condemning that which is unfair, unbusinesslike or dishonorable in their dealings.

We can correctly divide our industry into two great branches. Of one the product is a standard article, be it a stove, pulley, sash weight, pipe or car wheel, the cost of producing either of which is well understood and known by the respective foundrymen, and for which prices can be readily fixed.

The other great branch produces castings so varied in character and often so different from anything preceding that the making of a price is wholly the result of individual judgment, or rather guessing, which may prove good or bad after the work is completed.

In this branch of our business, especially amongst those engaged in the casting of general machinery and building material, the greatest cutting of prices prevailed.

The causes for this were many. In past years our industry was combined with machine shops, more so when on a large scale, only smaller shops, doing a repair business or perhaps manufacturing a specialty, were without foundries, obtaining their castings either from the larger shops or jobbing foundries, which were few in numbers and on a limited scale.

The gradual growth of machine shops without foundries naturally developed the business of the jobbing foundries. This was eminently so in larger business centres where special machine builders congregated.

In time, as the jobbing foundries multiplied to meet the increasing demand for castings, the competition for the work, of course, kept pace, and the older combined shops were crowded out as mere sellers of castings, limiting their foundry to the supply of such castings as were required in the building of their machines except during dull periods, when they competed with the jobbing foundry, even if at losing prices, to keep up their foundry organization for their legitimate business.

Before the era of jobbing foundries, the price of castings was not a factor affecting the welfare of any one; of course, economy was essential, but only so far as it formed a part of the expense in producing a machine, no more than the cost of forgings or machine labor. In fact, the making of castings was not an industry as it is to-day, but merely the product of one of the departments of a machine shop.

To-day the prices of castings are fixed by the jobbing foundry to which the combination shops must adjust themselves, retaliating by becoming a most dangerous cutter of prices when trade is dull.

The cutting of prices was not so much due to lack of work as it was to bad guessing and jealousy. The more the bidders the worse the guess. Shrewd buyers, aware of this weakness, went from foundry to foundry until they found the guesser they wanted.

Thus it happened that brokers or middle men could undertake contracts for castings at prices less than those submitted by competitors who were actually engaged in the foundry business, the broker pitting against them the bad guess of some brother foundryman not in the original competition.

Many of these evils can be corrected by a proper code of practice; for example, the issue of a synopsis of the bids after a contract is awarded, and the insistence that bills shall be

received and opened at a stated time, after which no bid shall be valid.

This method is in vogue by the government and building trades, and has undoubtedly proved a benefit to all concerned.

Only by concerted action can we remove these causes, and concerted action must come though this association.

The association should be national, subdivided into chapters located in the various cities and towns, corresponding with each other through this parent organization. Each chapter should be sub-divided into sections representing the different branches.

Friendship and mutual respect should be cultivated by the interchange of visits between chapters, making the occasion one of business and pleasure. An annual convention should be held for the transaction of business, recreation and exchange of hospitality.

A monthly or weekly journal should be issued, containing the transactions of the chapters, convention, price lists, articles of a technical nature, prevailing wages, questions and answers, etc., as is usual for such publications.

Finally, I cannot too strongly urge the importance of suitable topics for discussion at our meetings. If we want our meetings well attended, we must be prepared with subjects of interest for discussion. To come many miles to a meeting and go through a simple routine, is not enough.

I hope it will not be long ere our meetings will be looked forward to with anticipations of pleasure and gratification.

We cannot be too thankful to those gentlemen who have already furnished us with interesting and useful papers, relating to our industry, and nothing can be of greater value for the stability of our society than discussion and debate at our meetings, whether it be a carefully prepared article or thoughts expressed on the spur of the moment. Let us do all in our power to encourage it.

With patience and perseverance we cannot fail to ultimately succeed in our aims and our endeavors will be rewarded by thrift and contentment.

DUNDEE ASSOCIATION OF ENGINEERS AND IRON FOUNDERS.

PRICE OF CASTINGS.

(Copy in Dollars and Cents.)	Per lb.
Pulley and Drum Castings	.03½
" " " " Split	.03¾
Wheel and Pinion Castings, 1 lb. and under by arrangement.	
Wheel and Pinion Castings, above 1 lb., to and inclusive of 3 lbs	.07
Wheel and Pinion Castings, above 3 lbs., to and inclusive of 7 lbs	.06
Wheel and Pinion Castings, above 7 lbs., to and inclusive of 14 lbs	.05½
Wheel and Pinion Castings, above 14 lbs., to and inclusive of 28 lbs	.05
Wheel and Pinion Castings, above 28 lbs., to and inclusive of 56 lbs	.04
Wheel and Pinion Castings, above 56 lbs., to and inclusive of 112 lbs	.03½
Wheel and Pinion Castings, above 112 lbs., to and inclusive of 1,120 lbs	.03¼
Twisted Wheels and Spur and Bevel, combined, from 7c. to 5½c. per lb., according to pitch.	
Wheel and Pinion Castings, below 14 lbs., and Twisted Wheels and Spur and Bevel, combined, when cast Split, ¼c. per lb. above List Rate.	
Other Castings, 1 lb. each and under, by arrangement.	
Other castings, above 1 lb., to and inclusive of 3 lbs.	.05½
" " " 3 lbs., " " 7 lbs.	.04½
" " " 7 lbs., " " 14 lbs.	.03½
" " " 14 lbs., " " 28 lbs.	.03¼
" " " 28 lbs., " " 112 lbs.	.03
" " " 112 lbs., " " 1,120 lbs.	.02¾
" " " 1,120 lbs., by arrangement.	
Straight Flanged Pipes from Pattern	.02¾
" " " " Loam	.03¼
Bends and Branches from Pattern	.03¼
" " " " Loam	.04
Weights, over 7 lbs., and Common Fire Bars	.02

Quarterly accounts, subject to 2½ per cent. discount.

NOTICE.

All advertisements under this head given two insertions free of charge when placed therein by subscribers. All others will be charged 2 cents per word for each insertion.

FOR SALE—Foundry and machine shop in a flourishing manufacturing city; small capital required; satisfactory reasons for selling. Address, Wm. Engbeing, Cedarburg, Wis. 10

WANTED—A good practical moulder to invest $500 to $1,000 in a small jobbing foundry doing a good business in a growing town and to take charge of and run it. A good thing for the right man. Address, Machinist, care THE FOUNDRY.

WANTED—A foreman patternmaker, must be thoroughly familiar with the construction of large and small wood and metal patterns, also to take charge of between 20 and 30 men. Apply in writing, giving age, experience, references, salary expected to Mechanical Superintendent of Thomson-Houston Electric Co., Lynn, Mass.

WANTED—A superintendent, capable of taking charge of an iron foundry, melting between 20 and 30 tons of grey iron per day. Apply in writing, giving age, experience, references, salary expected, to Mechanical Superintendent of Thomson-Houston Electric Co., Lynn, Mass.

DRAFTSMAN—Age 22, wishes to be re-engaged. Can furnish best of references from the places with which he has been connected. Salary to commence with moderate. Address, Ability, this office.

FOR SALE—Foundry and Machine Shop located in a live, growing city, with railroads, colleges, schools, churches, etc., which excels anything in the West. Will sell cheap on easy terms. Address, Chas. Gilbert & Son. Albany, Mo.

WANTED—A foundry foreman for a foundry doing general work; sober, industrious man with good recommendations; good, permanent job to the right party. Address, U. F. M., care of THE FOUNDRY

JEREMIAH DWYER.

IT will be readily conceded on all sides, that THE FOUNDRY could not have selected a more worthy subject with which to inaugurate this series of articles which we propose to give to the foundry world, illustrative of some of those men who have made this great American industry what it is, than Jeremiah Dwyer, President of America's largest stove manufacturing establishment, viz: The Michigan Stove Company of Detroit. Like many of America's sons who have left their mark upon the history of its prosperity, Mr. Dwyer had not in youth, those early advantages which are acknowledged to be such powerful factors in the making of successful business men. He was born of Irish parents in Brooklyn, N. Y. August 22, 1837, one year later his father removed to Michigan and located on a farm four miles from this city, where the following ten years of our subject's boyhood days were passed. In 1848 his father was thrown from his wagon through the running away of spirited horses, and killed, and thus at the age of eleven, Jeremiah Dwyer, with such help as could be rendered by his mother, was compelled to take the management of the farm, the remaining members of the family consisting of a younger brother and sister. Two years later the mother, mindful of her children's future, sold the farm and removed to Detroit to take advantage of superior educational facilities for them, but his mother's means being limited, after a few years, young Jeremiah determined to seek employment and found work in the planing mill of Smith & Dwight, remaining about one year, and leaving there to become an apprentice in the foundry of the Hydraulic Iron Works of Kellogg & Van Skoyke. After completing an apprenticeship of four years Mr. Dwyer "took the road" as a journeyman moulder, working in several eastern cities, after which returning to Detroit, he was compelled by ill-health to leave the foundry for a short time, and for about a year he worked for the Detroit, Milwaukee & Grand Haven R. R., leaving there to become foreman of the Geary & Russell Foundry. About this time, 1861, Mr. Dwyer, his brother, and T. W. Mizner, organized the firm of J. Dwyer & Co., to manufacture stoves on a small scale. Some two years later, Mr. Mizners interest was purchased by W. H. Tefft and M. I. Mills, and with James Dwyer, they organized the business into a joint stock company in 1864, under the title of the Detroit Stove Works, Jeremiah Dwyer taking the management. Later on, while superintending the erection of the new works, Mr. Dwyer contracted a severe pulmonary illness that compelled him to dispose of his Detroit interests and under the advice of his physician, removed to a southern climate. Returning to Detroit in 1871 he organized with Messrs. Charles DuCharme Long, Mills and Barbour, a new company, since known to fame as The Michigan Stove Company, which, from a modest beginning, has become second to no like concern in the world, employing from twelve to fifteen hundred men.

Mr. Dwyer is also a charter director of the People's Savings Bank, Vice-President of Buck's Stove & Range Company of St. Louis, Mo., and interested in many other enterprises, but if there is one thing more than another for which he has been widely known, it is for remarkable geniality and the genuine unaffected simplicity of his manner, kind and considerate always, although one of America's most prosperous foundrymen, he never forgets those early days of hardship and consequently it comes natural to one whose heart teems with charity to all men, to be ever mindful of the Golden Rule in all his dealings, be they with his business associates or his humblest employe.

THE FOUNDRY takes especial pleasure in directing the attention of all, especially its younger readers to the lessons taught by Mr. Dwyer's life, and to remind them that industry and strict integrity are things not copyrighted, and can be made the key always to success.

A LIGHT FOR FOUNDRIES.

ON another page will be found the advertisement of the Industrial Light Company of New York, manufacturers of the now well-known "Lucigen" system of lighting, a system by which the best value and results in lighting are said to be obtained from the use of the crude, cheap classes of petroleum oils.

While loth to officially indorse anything that we advertise for the first time. Yet this light appears to be so highly appreciated by so many well known business concerns known to us, and who would not subscribe to anything that they had not fully tested, that we feel that we would be remiss in our duty to our subscribers and general readers, were we to neglect to call especial attention to it. The company's illustrated catalogue lies before us, and contains a list of names of patrons of which many a more pretentious manufacturer might be justly proud.

We are told that these illustrated catalogues will be sent to anyone on application, and that the company can refer, by permission, to more than 90 per cent. of its customers, and will gladly have inquiries made of any of them, for the goods stand squarely on their merits.

We clip the following letter from among the many in its handsomely illustrated catalogue.

TESTIMONIALS.

ENTERPRISE M'F'G. CO. OF PHILADELPHIA.

Philadelphia, Pa., Dec. 6, 1892.

Messrs. Parvin & Co., Philadelphia, Pa.

GENTLEMEN:—It is with pleasure we report to you that we have given the Lucigen light our most careful attention and are well pleased with them. We find they consume about one and a half gallons of oil per light per hour. We are now using in our foundry, which is 257x 60 ft., with a wing 55x60 ft. We believe these five lights (F. burners) *give us fully five times the amount of light that we previously had with gas, and we find the cost to be 20 per cent. less than we were previously paying for gas.*

The insurance companies have given the matter their careful attention and have decided it a safe light for foundry buildings. We have decided to put in several more; we believe them to be far superior and cheaper than the electric light.

Yours truly,

Enterprise M'f'g. Co. of Philadelphia,

T. HENRY ASHBURY, President.

LET US HEAR FROM SOME ONE.

A CORRESPONDENT in a distant part of the continent writes as follows: We melt up old worn steel shoes and dies, and find it very hard to get the steel to run at the end of the heat. Have tried Aluminum Alloy with poor results. Can you give us a remedy?

EVERY FOUNDRYMAN SHOULD READ IT.

IT gives us much pleasure to announce that the January number of THE FOUNDRY will contain an elaborate article on testing iron by W. J. Keep of the Michigan Stove Works, Detroit, Mich., which will give a comprehensive explanation of the system known as "Keep's Tests." It will be fully illustrated and written in such a manner as will make it easily understood by anyone having a slight knowledge of foundry matters. As it will be a most valuable contribution on this subject, all should read it.

Remember that to clubs of eight or more THE FOUNDRY will be sent for one year for 75 cents each.

MACHINE MOLDING

THE development of machine molding has been gradual, covering a long period. The follow-board which covers, or shuts off, from the sand that portion of the pattern above the joint line, was probably the first change from the original method of molding in boxes. The match-plate, which is a plate fitted with pins and pinholes for the flask, with a portion of the pattern fitted thereon like a medallion, came next. This was a greater improvement, for it compelled the flasks to be interchangeable. Silhouette, or stripping-plates, followed with decided advantage. The stripping-plate, often called drop-plate, is a plate cut out to receive the outline of the pattern at the joint line; enough is added to the pattern to protect through the plate to the pattern base. Like the match-plate it is fitted with pins and holes to receive the flask; it is also a molding table, or board on which the flasks are rammed. Originally, this plate was turned with the flask, and the pattern drawn through the plate by hand. Modifications of the stripping-plate are numerous, nearly all embodying a frame or table, with lever attachment for drawing the pattern without turning the flask. A good illustration of this type is the machine for molding pulleys.

The evolution of the power machine from the hand machine was natural, and there are a number of excellent power machines on the market; operated, respectively, by belts and cams, hydraulic, pneumatic and steam pressure.

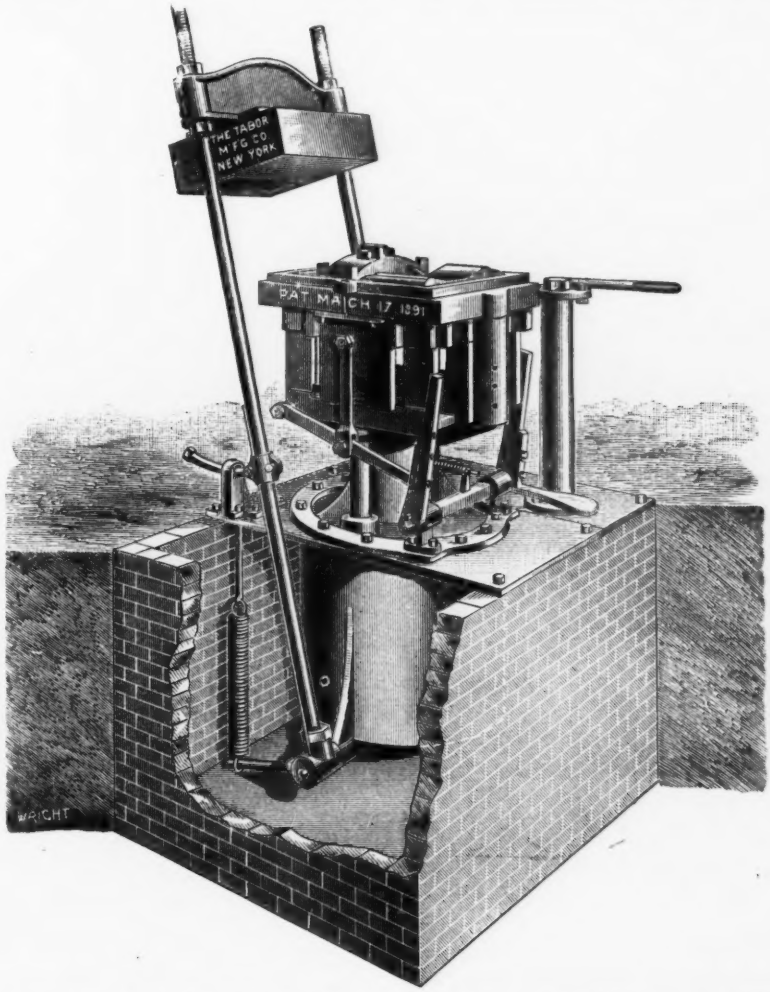
The one illustrated is manufactured and sold by The Tabor M'f'g. Co., 111 and 113 Liberty St., New York.

The particular machine from which these cuts were made is in use in the foundry of Samuel L. Moore & Son's Co., Elizabeth, N. J., making five different kinds of brake-shoes, two of which are of the Christie type.

It is at once evident to any one witnessing the operation of the machine that it is making shoes which are super-

ior to those ordinarily made by hand, and as to the rate at which they are made it is, perhaps, best to state the actual observed time as noted by the writer, within which a mold was made and placed on the floor, ready for pouring.

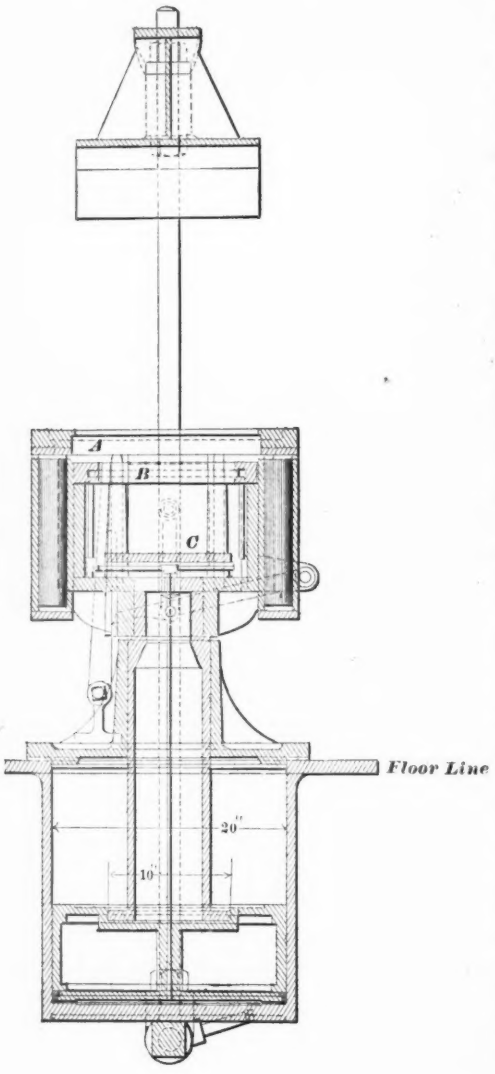
The machine is what is called a 16-inch, that being the size flask intended



to be used on it. In this case the flask was 14″x17½″; patterns being arranged for two shoes, which are cast in an inverted position with respect to each other; *i. e.*, of two shoes cast in the same flask, one will be cast face upward, while the second will be the other side upward. The machine is attended by a man with some experience, and he is assisted by a boy, each having certain routine operations to perform, which are repeated exactly for each mold. The "drag" or lower part of a mold is first made, and when a lot of these are completed and put on the floor, some slight changes are made in the arrangement of the machine, requiring but very few minutes to complete, and copes are then made, the arrangement of the patterns in reverse position, as noted above, making the drag and cope just alike, and doing away with the necessity for any change in the patterns.

Timing the machine, it was found that in making the drag the time required to make a complete cycle of movements, *i. e.*, the time from the

placing of one drag on the floor to the placing of another beside it, was 34 seconds; the distance walked with the drag being, in this case, about 20 feet. In the case of the cope, 35 seconds were required, thus making the time for a complete mold 1 minute 18 seconds, which is at the rate of something over 46 complete flasks or 92 shoes per hour.



No special effort was manifest during this time, yet no one familiar with manufacturing operations would expect this rate to be maintained for a day, nor even for an hour, under ordinary circumstances; yet after seeing this time made it is evident that Mr. Harris Tabor's statement, that 25 molds per hour are easily practicable with the machine, is far within the range of its capacity, as, indeed, he intends it to be. In fact, machines are in use on which this is very much exceeded, the product depending largely, of course, upon the character of the work, and the arrangements made for facilitating it.

One of the cuts shows the floor cut away to give a view of the part of the machine below the floor line, and on this page sections of the machine are given which have been made from working drawings. The piston takes steam on the under side only, its weight being sufficient to return it promptly after the mold is rammed.

To the piston rod is attached the principal part of the mechanism, consisting of a table with lugs projecting upward, and supporting the pattern frame *B*, upon which rest the patterns; the stripping plate frame *A*, directly over the pattern frame, and resting on it, to which the stripping plate is attached; the stool plate *C* suspended to the stripping plate frame, and moving with it; side levers and tumbling shaft for tripping after the pattern is drawn. The pattern frame has an annular passage which is connected to the cylinder by the small pipe shown, the object of this being to admit some steam to the pattern plate at each movement of the piston, this steam serving to keep the patterns moderately warm, preventing "sweating" or accumulation of moisture from the atmosphere, and making them draw from the sand more freely and smoothly. The stripping plate frame is guided by two bored sockets, one at the front, and the other at the back of the machine, there being air holes below the pistons, by which any desired amount of cushion can be obtained for the drop of the stripping plate frame. The stool plate is really part of the stripping plate frame placed below the pattern frame, and its object is to support stools or internal parts of the stripping plate used in holding green sand cores, or heavy bodies of hanging sand, while the pattern is being drawn. The

side levers are pivoted at one end to the table, and are connected at the middle, by links, to the stripping plate frame, the outer end being free. The tumbling or tripping shaft is in front of the machine, near the floor, and has arms projecting upward along the line of travel followed by the free ends of the side levers; on these arms are stops which engage with the free ends of the levers on the downward motion, to draw the pattern.

The ramming head is carried by the wrought rods seen at either side of the machine, these being attached to a horizontal shaft at the bottom of the cylinder, which allows them to be swung forward and back as shown, a spiral spring being used to counterbalance the weight. The ramming head is usually of wood, roughly cut out over the pattern, to avoid too hard ramming on the high places. This block may, of course, be readily changed to suit any flask within the capacity of the machine. The stops on the stripping plate can be also changed to suit any pattern within the range of the machine. The steam pipe enters the cylinder at the bottom, and from the throttle valve to the cylinder serves also as an exhaust pipe, the throttle valve being a two-way cock by which steam is either admitted or exhausted from the cylinder.

The operation of the machine is very simple. The half flask is put on the stripping plate, with the sand-box to hold the sand which is to be compressed, and both are filled with sand. The ramming head is then swung forward over the flask against stops which define its position, and the throttle valve opened. The upward motion of the piston and attached parts carries the flask and sand up to the ramming head, where it is rammed instantly, and upon the throttle valve lever being moved again, steam is cut off, and at the same time exhausted, allowing the flask to descend; the stops then engaging the free ends of side levers, and arresting the downward motion of the stripping plate at a point about midway; the pattern, continuing to descend, is drawn from the mold, and when the piston has returned to its lowest position the sand is struck off the flask, which is then taken from the machine. As the man removes it he presses the tripping treadle with his foot to release the stripping plate frame, which then falls to its proper position with respect to the pattern, and the machine is then ready for another mold.

Water or compressed air may be used instead of steam, if it is desirable, though it is believed that steam is preferable in most cases; because it is usually easily obtained without the use of other special auxiliary machinery of any kind; it is cheaper, and the steam appliances coming under the charge of the fireman or engineer, the foundry is relieved of the care of them. The machines are, of course, built of any desired size, according to the work to be done.

NEW YORK AND VICINITY.

A pleasing feature of the foundry business in this city, Brooklyn and Jersey City, N. J., at the present time, is the general satisfaction that prevails amongst employees and employers, on account of the large orders that have been executed during the past six months. Also those that are still in course of completion, and the continued demand for nearly all kinds of castings.

All connected with the industry in the above locality can congratulate themselves upon its prosperous condition, enjoy a happy Christmas and look forward with renewed hope to the coming year. Amongst the machinery and jobbing shops, in this city, during the period above mentioned, none have been more pressed with orders than R. Hoe & Co., Printing Press Manufacturers. Mr. Jas. Cowan, their energetic foreman, has had every inch of space in the foundry occupied, but was unable to supply the demands from the machine shop for more castings. Consequently a large amount of their work was given out to jobbing shops in the vicinity. It is evident that the results were not entirely satisfactory to the firm, as they have recently leased and put in operation a foundry in Brooklyn, N. Y., under the management of Sam Henry, who was formerly assistant foreman of their New York foundry. The undertaking has evidently proved a success, as improvements in the condition of the shop are being pushed forward. Other foundries in Brooklyn that are busy are Smith & Co.

and Healy Bros., jobbing shops. The E. W. Bliss foundry is also doing a good business with castings for their hydraulic presses.

In Jersey City the Hitchens foundry has been doing a rushing business with their green house heaters. The jobbing foundries of Thos. Goddard, Ed. Gibbson and Arthur King are all in full blast.

Messrs. J. B. & J. M. Cornell have just completed the iron work for the handsome and commodious building of Stern Bros., on Twenty-third street, between Broadway and Sixth avenue, it is a seven-story and basement, the columns in the first and second stories are fire proof.

Messrs. J. B. & J. M. Cornell, New York city have laid the foundation for a new pattern shop adjoining their foundry at Twenty-fifth street, near Eleventh avenue. It will be 70 feet square and seven stories high. Three stories will be used for a workshop and the remainder for storage of patterns.

The foundry of Bell & Fyfe, North Eleventh street and Kent avenue, Brooklyn, N. Y., is running full blast with orders on hand sufficient to employ 50% more molders, if they had the room. In the loam department the principal work is on condensers and air compressors for the Ingersol Rock Drill Co., of New York City. Mr. Chas. Ashurst is foreman.

The jobbing foundry of P. & E. Campbell in Hoboken, N. J., is running full capacity. They have large orders for castings for marine engines, etc., from the W. & A. Fletcher Iron Works in that city. They are also doing castings for the Wheatherhead Green House Heater. Notwithstanding all this work that is going on in the vicinity, a number of foundrymen are finding time to examine the columns of the bright little magazine that has come to the front to champion their cause, after which they most readily subscribe.

The firm of Brown, Ritchey & McDonald have removed their foundry and finishing shop from Union avenue and North Eleventh street, Brooklyn, N. Y., to the buildings formerly occupied by the Cheney & Heulett Iron Works at Clay street and Newtown Creek, Green Point, Long Island. Their new quarters will be commodious. They will be prepared to furnish all kinds of architectural castings. Mr. Thos. Gillightly, who has had long experience in the Hecla Architectural Iron Works of Brooklyn, N. Y., will be the foreman of the foundry.

In the architectural line in this city, the Jackson Co., and J. B. & J. M. Cornell, have been very busy and still remain so, although it is not the regular season for a brisk business in that line. Following is a list of the buildings that the Jackson Co. are constructing the iron work for: Criminal Court House, Centre and Franklin Streets, a seven-story and basement; Metropolitan Life Insurance Co., Twenty-third street and Madison avenue, ten-story, basement and cellar; Cassett estate, 495 and 497 Broadway, eight-story, basement and cellar; Goldenberg, Washington place and Green street, eight-story, basement and cellar; Brooklyn Storage & Warehouse Co., Schemerhorn street, Brooklyn, eight-story, basement and cellar; W. C. Rhinelander, Duane and Rose streets, ten-story and basement; L. A. Wendel, Bleeker and Green streets, six story, basement and cellar, and they have recently completed the Carnegie Music Hall in New York. The castings for the main stairway in the Metropolitan Life Insurance Co.'s building are to be made in bronze.

The Jackson Co., New York City, have decided to light their foundry and finishing shop by electricity, they will also add to their plant a new boiler and an engine of 150 horse power. They have been casting in the neighborhood of thirty tons of metal daily in the iron foundry for some time.

DAN BELL.

PHILADELPHIA.

Great interest was shown last month in the first annual meeting of the Foundrymen's Association held at the Manufacturer's Club, by a large attendance from both the city, state and other localities. The proceedings of which were published in the *Iron Age*, November 10. The President's address will be found in this issue and should be read.

With the exception of some of the woolen machinery manufacturers, the business of the past month has been very satisfactory, judging from the volume of work done, though many are dependent on each day's mails for their orders, and cannot get work ahead.

The price for the general character of castings ranging from 2c to 3c per lb., is indeed, far from being very profitable. But with the hope of obtaining more profitable contracts, there are many seeking the work, and often at a less figure.

At a meeting of the board of directors of the Norristown Steel Co., of Norristown, Pa., the

following officers were elected: President, Mr. Jos. H. Hampton; Vice-President and General Manager, Mr. Geo. J. Humbert; Secretary, Mr. E. M. Daniels; Treasurer, Mr. C. C. Highly. They have recently enlarged their plant and now have a foundry building 340 feet long by 100 feet wide, equpped with two 20-ton open hearth furnaces, three drying ovens 15x30 feet each and two 20-ton electric traveling cranes; a machine shop 80x50 feet, with all modern machinery for finishing castings; are running one heat per day and full of orders. Estimates for open hearth steel castings, either rough or finished, will be cheerfully given.

Messrs. Thomas Devlin & Co., at American and Dauphin streets, Philadelphia, Pa., are building a new warehouse in connection with their present works that will be 122x44 feet. It will be six stories high, and will afford them increased facilities for supplying their increasing trade.

The Phœnix Iron Co., of Phœnixville, Pa., have an order for 44 wheels for a drawbridge over the Missouri River at East Omaha, Neb. They weigh 2,400 lbs. each, are 18 inches face, three feet diameter and each required to stand a pressure of 1,500,000 lbs. At the same fray they recently cast a bar four feet, six inches in the span, one inch square, that stood a pressure of 979 lbs. to the square inch.

The Williamsport Valve & Hydrant Co., of Williamsport, Pa., have erected a plant for the purpose, as applied by their title, with buildings 128x45 feet and 31x32 feet, respectively. Mr. B. B. McCarthy is managing owner, and reports that they are now ready to take orders and will do their own casting and finishing.

The Tacony Iron & Metal Co., of Tacony, Pa., have finished and placed on exhibition in the court yard of City Hall, Philadelphia, the bronze statute of William Penn. Some morning the citizens will be surprised to see it looking down upon them from the top of the tower. The work will be an engineering feat, as it weighs about 35 tons, is 37 feet high, and the work of placing in position will be accomplished in one night. HOWARD.

HARTFORD, CONN., AND VICINITY.

The Horton Chuck Foundry at Windsor Locks, Ct., are turning out an assortment of chucks to be exhibited at the World's Fair.

Commencing Nov. 18, the W. & B. Douglas Co., Middletown, Ct., will work but eight hours a day until further notice.

It is rumored that the Eddy Electric Co., of Windsor, Ct., contemplate the erection of a large iron foundry, soon.

The Hartford Woven Wire Mattress Co., are erecting a building 80x40 feet, part of which will be used as a foundry. They make iron beds and light ornamental work. They will use a Burdette Loomis Gas Furnace, two pots and melt about one ton per day.

I would like to inquire if any of the readers of THE FOUNDRY have considered the possibility of producing a durable mold. One that can be used an indefinite number of times and yet be perfect. After some experimenting, a shopmate and myself were enabled to produce a mold, having for a pattern a washer 4 "dia x 1" thick and cast it thirteen times in one day. The question naturally arises; what effect such a mould would have on the iron? I found the castings to have a clean bright skin and much softer than others of the same mixture cast in green sand. Having cast thirteen times I found the mold *checked*, caused, no doubt, by contraction. Not having the means for further experiments we were compelled for the time to let it drop. LOUIS N. PERO.

If you are not already a subscriber to THE FOUNDRY, you should be. Why not form a club and take advansage of reduced rates. Eight or more subscribers can have it sent to each address for 75 cents each.

FOUNDRY FACING FROM ANTHRACITE CULM.

A NEW industry in Carbon County is the manufacture of foundry facing from anthracite culm, which has just begun at Hauto, on the Nesquehoning branch of the Central railroad of New Jersey. The factory has a capacity of twelve tons per day. There is a never failing supply of culm. Huge piles, containing millions of tons, rise on all sides of the works.

Remember that to clubs of eight or more THE FOUNDRY will be sent for one year for 75 cents each.

HOWARD EVANS.

THOUGH not a practical foundryman, it is questionable whether any man in America has become more prominent in foundry circles during the past year than the subject of our sketch and as the chief pusher of the Foundrymen's Association, we doubt if any man has done more for the business during that time.

As a member of the firm of J. A. Emerick & Company, foundry supply dealers, Mr. Evans came into close contact with the foundrymen in the eastern states and was by them urged to take the initial step which resulted in the forming of The Foundrymen's Association, with which he has been so prominently identified.

HOWARD EVANS.

It is only a few years ago that the price of castings was double what it is now and the ruinous war in priceswas bringing injury to all connected with the business and if Mr. Evans and his associates accomplishedanything at all, every proprietor, stock-holder, or employee in the foundry industries of the country will owethem a debt of gratitude.

Mr. Evans is a Philadelphian and has always lived there, being now just thirty-nine years of age. He commenced his business career with the house of J. W. Paxson & Company, foundry supply dealers, going from there to J. A. Emerick & Company with whom he was connected seventeen years until the two great houses consolidated last August under the title of J. W. Paxson & Company, he being now a member of the latter firm. As an indication of the measure of success attending his efforts, he now sends out seven hundred notices each month and has had the pleasure of seeing similar bodies organized in Washington, D. C., Pittsburgh, Pa., and Cleveland, Ohio. It is hoped, in time, that the mutual distrust now so apparent between keen competitors may so far be worn away that a list of prices may be formulated and adhered to and that foundrymen may receive equal compensation with other branches of the iron business having a like capital invested.

As a business man, Mr. Evans has many warm friends and is possessed of a pleasant, engaging manner which is fo itself a capital that must be sure to yield a good dividend at all times and to which perhaps much of his success in life is to be attributed.

Prairie City, Iowa is to have a new foundry. The name of the new company will be The Dowden Mn'f'g Co., Limited. Amountof stock will be $40,000.00, with $25,000.00 paid up capital. Lots have been purchased upon which to build the new factory and foundry. The new buildings will be frame and will cost, including machinery, about $6,000 when completed. The plans are nearly complete and work will begin upon their conrstuction as the weather will permit.

The Sharon Steel Casting Co., Sharon, Pa., are working on large contracts which will keep their plant fully engaged for the coming three months.

PERSONAL MENTION.

Mr. Ellis Rinard has taken charge of the foundry of the Levers M'f'g. Co., Oskalosa, Ia.

Robt. Gibb has resigned his position as foreman of the Duluth M'f'g. Co., Duluth, Minn., to accept a like position in Chicago, Ill.

Frank Glasford, who has been foreman of the Trinidad Colo. Foundry, has removed to Streetor, Ill. A Mr. Blethen who has been in the foundry business at Boston, Mass., takes his place.

Mr. F. W. Sargent, formerly engineer of lists with the C. B. & Q. R. R., and recently general agent of the Congdon Brake Shoe Co., Chicago, Ill., is now superintendent of the latter company's brake shoe and iron department.

Jas. A. Lyle, Nov. 7th, took charge of the foundry of the Clinton Bridge & Iron Co., Clinton, Ia. For Mr. Lyle we predict a successful future as a foundry foreman. Not only is he a thorough molder, but a good mechanic in a general way, having a good education and plenty of energy and push.

Mr. Jno. H. Fleming, formerly of this city, has been appointed superintendent of the Niagara Car Wheel Co., of Buffalo, N. Y., who are now erecting a large plant in that city. He has for several years past been superintendent of the New York Car Wheel Works of Buffalo, also of the St. Thomas Car Wheel Co., of St. Thomas, Ont.

The article appearing in the November issue of THE FOUFDRY entitled "The Relation of a Foreman to His Men" was through an oversight not credited to its author, Mr. E. A. Burton, Superintendent of the Kansas City Switch & Frog Co., and as it was an exceptionably good contribution we are especially desirous that its author should have the credit.

The co-partnership formerly existing between Isaac S. Cassin and Josiah Thompson, under the name of I. S. Cassin & Co., Philadelphia, Pa., has been dissolved and the Union Hydraulic Works will be hereafter conducted under the name of J. Thompson & Co. Mr. Cassin was formerly chief engineer of the Philadelphia water works. Mr. Thompson is a very enterprising man who has spent many years in the foundry and machine shop, and all who come in contact with him leave with a good impression.

Why don't you subscribe for THE FOUNDRY?

THE FIRE FIEND.

Fire destroyed the foundry of King & Anderson, 218-222 North Union street, Chicago, Ill., to the extent of $1,000, Nov. 2nd.

Van Berger & Co.'s foundry at Carbondale, Pa., burned down Nov. 6. Loss, from $25,000 to $30,000.

The Jordon L. Mott Iron Foundry at Mott Haven, N. Y., had a narrow escape from fire a week or two ago. Damages as it is amount to $1,000.

The Standard Foundry at St. Louis, Mo., has been destroyed by fire. Loss $45,000.

A. Carpenter & Sons' Iron Foundry, Providence, R. I., was burned a few weeks ago. Damages $25,000.

The foundry of A. C. Williams, Chagrin Falls, O., burned Nov. 25. Loss $35,000.

BOOKS, EXCHANGES, CATALOGUES, ETC.

Clevelend & Hardwick, engine and boiler builders, Erie, Pa., are sending out a very handsome catalogue of the articles of their manufacture. They make a substantial line of portable and stationary engines and boilers.

The S. Obermayer Co., are advertising through the medium of a blotter, a patent respirator for the protection of the lungs and throat of those engaged in dusty places. Just the thing for a man in a dusty mill room, or when engaged in "picking" out a cupola.

An elaborate catalogue of over 100 pages reaches our desk this month from the Huyett & Smith M'f'g. Co, of this city, who make a large line of pressure blowers, exhaust fans, hot blast apparatus, dry kilns, etc. Anyone in need of anything in this line would loose nothing by investigating in that direction.

An enterprising co-temporary, the *Scientific Machinist* of Cleveland, has come out in a new dress and looks much improved thereby. THE FOUNDRY inserted a small card advertisement in its columns a short time ago and if all its advertisers receive as good returns as we have the reason for its prosperity is easily apparent.

AMONG THE FOUNDRIES.

The Art Stove Co., of Detroit, Mich., have moved into their new general office building and warehouse. The new building is the tallest in the north-eastern section of Detroit. It occupies quite a large area and is built of

brick with stone facings. It makes a splendid addition to the already large plant of The Art Stove Co. The company's works now face on three streets, and with the added railroad facilities are in splendid condition to meet all demands of their rapidly increasing business. The interior of the new building is of modern construction, the sample room and offices being models in every respect. The Bolton Hot Water Heating Apparatus is used, and all together the company may well feel proud of their last addition.

Doffie & Stuarts new iron foundry in Buffalo, N. Y., is nearly completed.

The employees of the co-operative foundry, Rochester, to the number of between 400 and 500, received their usual Thanksgiving reminder in the shape of a turkey to each married man and oysters to the single men.

The foundry and machine shop formerly operated by Woodruff & Beach in Hartford, Conn., is idle and can be easily secured. As it is a first-class plant in every respect, the foundry of turning out 30 tons daily, it looks like a good opening for some one.

The Rice, Barton & Pales Co., of Worcester, Mass., are hurrying the construction of their new foundry. They hope to occupy it in the spring, and it is claimed it will be one of the best equipped establishments in the United States, electricity being used for illuminating and crane driving purposes.

The Keystone M'f'g. Co., of Rock Falls, Ill., are putting in a new Sturtevant system of heating and ventilating shop and foundry.

The Pratt & Whitney Co., of Hartford, Conn., have sold out to a syndicate in which Hartford and New York banks are largely interested. As an example of the degree of profit occasionally arriving from such transactions, we might just mention that a leading Hartford paper states that the stockholders received for each $100 stock $200 in cash, $100 of ordinary stock and $100 of preferred stock.

Ernest G. Knoepel, foreman of the foundry of the Kansas City Smelting Works, has commenced suit against Theodore Krauss, superintendent of the refining department of that institution, for slander, claiming that the latter has asserted that certain patents held by the former were secured by fraud and were by rights the property of the latter.

H. R. Ives, the well-known Montreal foundryman, has called a meeting of his creditors. The liabilities are over $100,000. The assets are expected to exceed that amount.

The foundry of Butler & Martin at Middletown, N. Y., has orders ahead for several months' work, turning out 5,000 pounds of castings a day.

H. W. Knight & Son of Seneca Falls, N. Y., manufacturers of pattern letters and figures, have recently doubled the size of their plant and are better prepared than ever to supply their customers. They carry a very large stock, consisting of a variety of sizes and styles. Send for a catalogue.

The Illinois Steel Company does not appear to be borrowing trouble on account of the recent election. Said a representative of that great company on Tuesday. "Manufacturers of steel and iron like ourselves are not likely to be affected in less time than two years, and as far as one can tell the Illinois Steel Company has not yet detected any signs of coming disaster under democratic rule."

The James Reynolds M'f'g. Co., 99 Mill River street, New Haven, Conn., are building an addition to their factory on account of increased business. They are putting in a new boiler and engine of increased power, made necessary by their increased business in the manufacture of molding machines, &c. The addition will be two stories, containing the boiler and engine room, and two additional machine rooms.

A Chicopee (Mass.) foundry has received orders for several bronze statues to be erected in Salt Lake City and in Philadelphia. A bronze statue of Brigham Young, one to represent an Indian in a sitting posture and a third a trapper, standing, are for the former place, and an equestrian statue of Gen. George B. McClellan, to be erected in front of the City Hall, Philadelphia. This will be seventeen feet high and a companion piece to the statue of Gen. Reynolds.

The Chester Steel Casting Company is building an addition to its works at Lamokin, Pa., for the use of the open-hearth department.

The South Chicago Foundry Co., 320 The Rookery, Chicago, have recently taken a number of very large contracts for their semi-steel, among them being one for the electric fountain at the World's Fair grounds. Inquiries for semi-steel have been numerous lately, and several have been received from England, Germany and other foreign countries.

MARKET REVIEW.

REPORTED EXPRESSLY FOR "THE FOUNDRY."

CINCINNATI.

Dec. 3, 1892.

The whole tendency of the pig iron market at present is toward small orders. The record of the week is a long run of carload and 50-ton orders with an occasional one of 300 and 500 tons. This is natural in view of the near approach of the first of January with the stock taking time. It is also a natural result of the election. The average purchaser of iron desires to think about the situation, hear what is said as to possible unfavorable legislation and see how the country generally takes the verdict. It would be a surprise if business was not very light until after January 1st. Indications point to healthful activity all along the line, and after the turn of the year there is every reason to believe that the requirements of the country for iron and steel in all forms will be up to the normal limit: One indication shows plainly that consumption is going on without diminution. Iron is being ordered forward on contracts in many cases faster than agreed deliveries, and much of the correspondence of an iron house is devoted to the hurrying forward of shipments.

The preqailing quietness has had no weakening effect upon prices: The leading Southern furnace companies have orders ahead for an average of 3 to 4 months product, and most of them would have all they could do to fill orders already taken if no more were offered for a couple of months.

We quote for cash f. o. b. cars Cincinnati :

Southern Coke, No. 1, F'dry	$13 75 to $14 00
" " No. 2, " and No. 1 Soft,	12 50 to 12 75
Hanging Rock Coke, No. 1	15 50 to 16 00
" " Charcoal, No. 1	18 50 to 19 50
Tennessee Charcoal, No. 1	16 00 to 16 50
Jackson Co. Stone Coal, No. 1	16 00 to 16 50
Southern Coke, Gray Forge	11 50 to 11 75
" " Mottled	11 00 to 11 25
Standard Alabama Car Wheel	18 00 to 19 00
Tennessee " "	17 00 to 17 50
Lake Superior " "	17 50 to 18 00

Rogers, Brown & Co.

CHICAGO.

Dec. 3, 1892.

We quote for cash f. o. b. Chicago:

Southern Coke, No. 2 Foundry	$13 50 to $14 00
Southern Coke, No. 2 Soft	13 25 to 13 75

Rogers, Brown & Merwin.

BOSTON.

Dec. 3, 1892.

The demand during the past two weeks has come almost entirely from foundries for small lots of iron for early delivery. The volume of business, however is quite large, but not up to what it was previous to the election. Inquiries are quite numerous, but mostly for carload lots. This tends to show that buyers are not contracting for large quantities, but merely buying to cover their immediate needs, meantime keeping a sharp eye on the advance of Southern Irons, that have taken place recently, which appears to be held firm all along the line. Some buyers here still hope that the prices prevalent six weeks back will again be had sometime in the near future.

We quote for cash delivered Boston :

Standard Alabama No. 1 Foundry	$15 50 to $16 00
" " " 2 "	14 50 to 15 00
" " " 1 Soft	14 50 to 15 00
" " " 3 Foundry	14 00 to 14 50
" " " 2 Soft	14 00 to 14 50
Embree No. 1 Foundry	16 00 to 16 25
Niagara (Strong L. S. Coke Iron.)	17 25 to 17 75

Rogers, Brown & Co.

F. G. Gibbs, Resident Agent.

ST. LOUIS.

Dec. 3, 1892.

The sales of iron during the past two weeks have been confined mostly to small lots excepting two sales of 1000 tons Lake Superior iron. Buyers in this territorty are all pretty well filled until the first of January and do not contemplate buying for next year's delivery until after the first.

Southern furnaces are still maintaining prices and complain that they cannot secure cars to ship orders already booked.

We quote for cash f. o. b. cars St. Louis :

Southern Coke, No. 1	$14 50 to $14 75
" " No. 2	13 25 to 13 50
" " No. 3	12 75 to 13 00
" Gray Forge	12 25 to 12 50
" Charcoal No. 1	16 00 to 16 50
Missouri " No. 1	14 50 to 15 00
Ohio Softeners	16 50 to 17 00
Lake Superior Car Wheel	18 00 to 18 25
Southern " "	18 50 to 18 75
Frick's Connellsville Foundry Coke	5 65

Rogers, Brown & Meacham.

J. K. Pollock, Manager.

BUFFALO.

Dec. 3, 1892.

Business in pig iron is jogging along at its normal rate with a larger amount entering into consumption than is usual at this season of the year. Prices are stationery with no immediate prospect of change. Southern irons are in the somewhat unusal condition of selling some grades at figures higher than the equivalent grades of their Northern competitors, the reason being their desirability in mixture, and the firm manner in which their recent advance in price has been sustained.

We quote for cash f. o. b. Buffalo.

No. 1 X Foundry, Strong, Coke Iron, Lake Superior ore	$15 25

No. 2 X Foundry, Strong, Coke Iron, Lake Superior ore	14 50
Ohio Strong Softener No. 1	15 50
Jackson County Silvery No. 1	17 30
Lake Superior Charcoal	18 00
Tennessee Charcoal	18 00
Southern Soft No. 1	14 40
Alabama Car Wheel	19 00
Hanging Rock Charcoal	20 50

Rogers, Brown & Co.
W. T. Shepard, Mgr.

PHILADELPHIA.

Dec. 3, 1892.

The demand for pig iron is not quite as heavy as it was a few weeks ago, that is so far as new business is concerned. Furnaces are behind on old orders owing to car shortage and freight blockades, and numerous foundries who usually carry a moderate supply have found themselves entirely out of iron. Orders should be placed at least six weeks in advance of actual requirement.

We quote for cash f. o. b. cars Philadelphia.

Standard Penna. No. 1 X	$15 50 to $16 00
" " No. 2 X	14 50 to 15 00
Standard Ala. No. 1 X	15 50 to 15 75
" " No. 2 X	14 50 to 14 75
Best Ala. Gray Forge	13 25 to 13 50
Standard Alabama C. C. C W., such as Bibb or Woodstock	20 50 to 21 00

Rogers, Brown & Warner.

PITTSBURGH.

Dec. 1, 1892.

The improvement in prices which many in the trade confidently expected would take place before this time, has not yet been realized. It is true that under heavy buying, Bessemer iron has stiffened up a little, but the advance, if any, is very slight, while all other qualities and grades of pig iron are just about where they were a month ago. At the same time there is some satisfaction to be found in the fact that the consumption has been unusually heavy, and that stocks have decreased, which shows a healthy state of affairs and affords good ground of encouragement for the future. As a rule the foundries and mills are all fairly busy, the chief complaint being that their output must be sold at very low prices. Pig iron quotations are as follows:

No. 1 Foundry	$14 50 to $15 00	cash
No. 2 Foundry	13 50 to 14 00	"
Gray Forge	12 50 to 12 75	"
Mottled and White	12 00 to 12 25	"
Warm Blast Charcoal	18 00 to 22 00	"
Cold Blast Charcoal	22 00 to 27 00	"
Bessemer	14 00 to 14 25	"

A. H. Childs.

DETROIT.

Dec. 6, 1892.

The market has not materially changed during the past month, and with the exception of some advances in Lake Superior charcoal, which is attributable to the very large decrease in stocks of this quality of iron shown in November, prices remain the same. Furnaces generally have their order books fairly well filled, and are content to wait until after the 1st of January before pressing sales, and as buyers also seem inclined to hold off placing any large business, the prospects are that December will be a quiet month. Finished material is in good demand, but prices are not quite so strong as in October and November.

With a few changes we repeat our quotations:

Lake Superior Charcoal, all numbers	$17 00 to $17 50
" " Coke, Bessemer	16 00 to 16 50
" " " Foundry, all ore	16 00 to 17 00
Standard Ohio Black Brand (40 per cent.)	16 50 to 17 00
Southern, No. 1	14 50 to 15 00
Southern Gray Forge	12 50 to 13 00
Jackson County (Ohio) Silvery	17 75 to 18 25

William F. Jarvis & Co.

LOUISVILLE.

December 3rd, 1892.

There has been no change in prices, iron continuing to sell for long delivery on basis of former sales. For prompt delivery one or two furnaces are offering below the prices held by the leading companies, but this has been their action throughout the year. Manufacturers report that while they are pushed for prompt shipments, orders for future delivery are not coming in to their satisfaction, they, however, feel that this may be owing to the close of the year, and that in January business will revive and be satisfactory, with a tendency towards higher prices. Buying here has been for delivery during the first six months of the year, and many of the buyers have purchased what they desire. The largest sale of the week was 1,000 tons of No. 2 soft.

We quote for cash f. o. b. cars Louisville.

Southern Coke, No. 1 foundry	$13 25 to	$13 50
" " " 2 "	12 00 to	12 25
" " " 3 "	11 50 to	11 75
" " Grey Forge	11 00 to	11 25
" Charcoal, No. 1 foundry	15 00 to	16 00
" Car Wheel	17 50 to	17 75

Geo. H. Hull & Co.

The Globe Foundry & Machine Works at Niles, O., are running full. Mr. Carter reports that there is a great demand for machine work.

The Michigan Foundry Co., of Battle Creek, Mich., are making some improvements. They have just finished putting in track and distributing ladles, and are now building track from foundry to pattern house and will use a car to carry patterns back and forth.

HAND & DRAW PLATE MOLDING MACHINES

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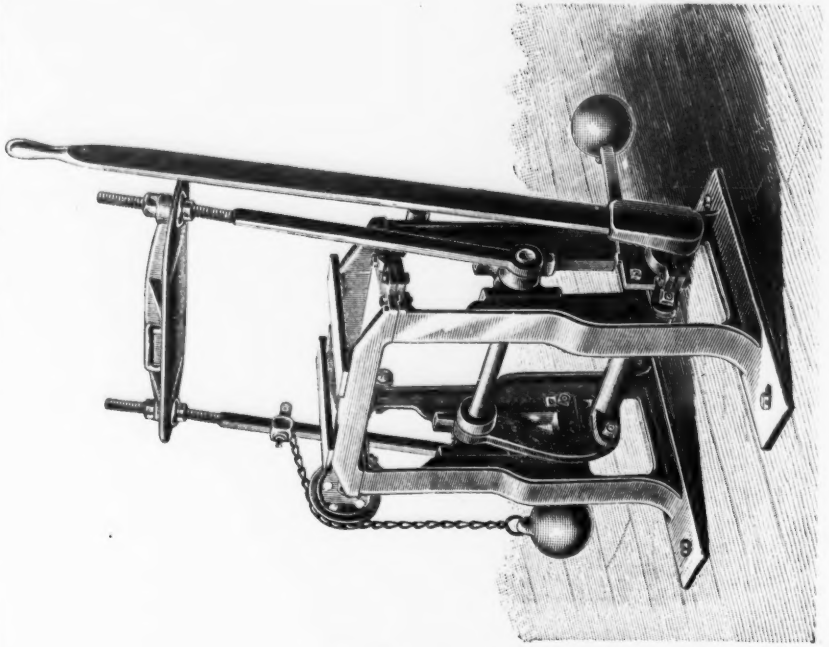

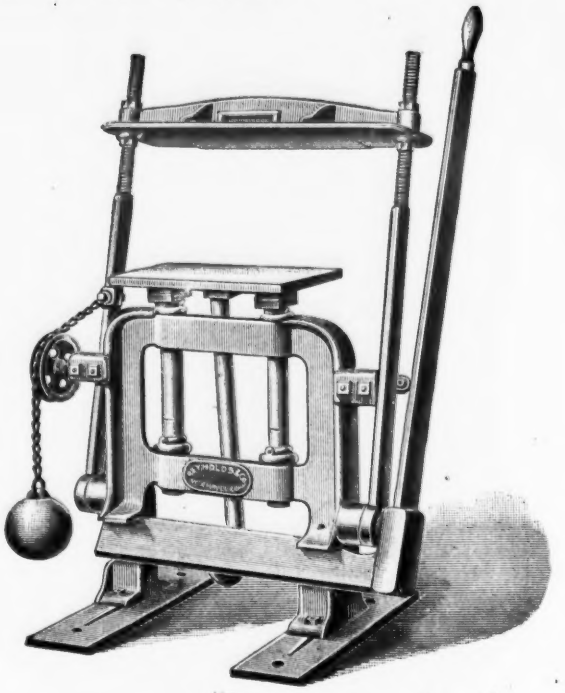

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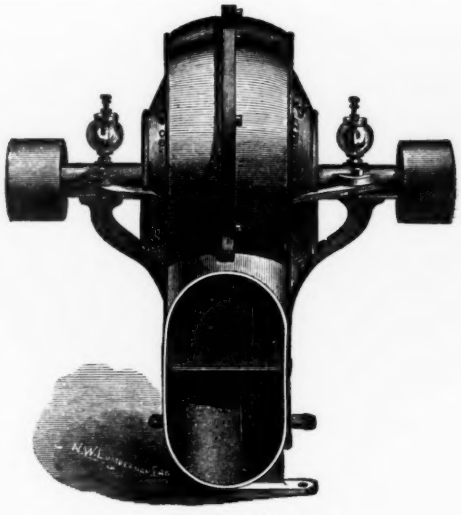

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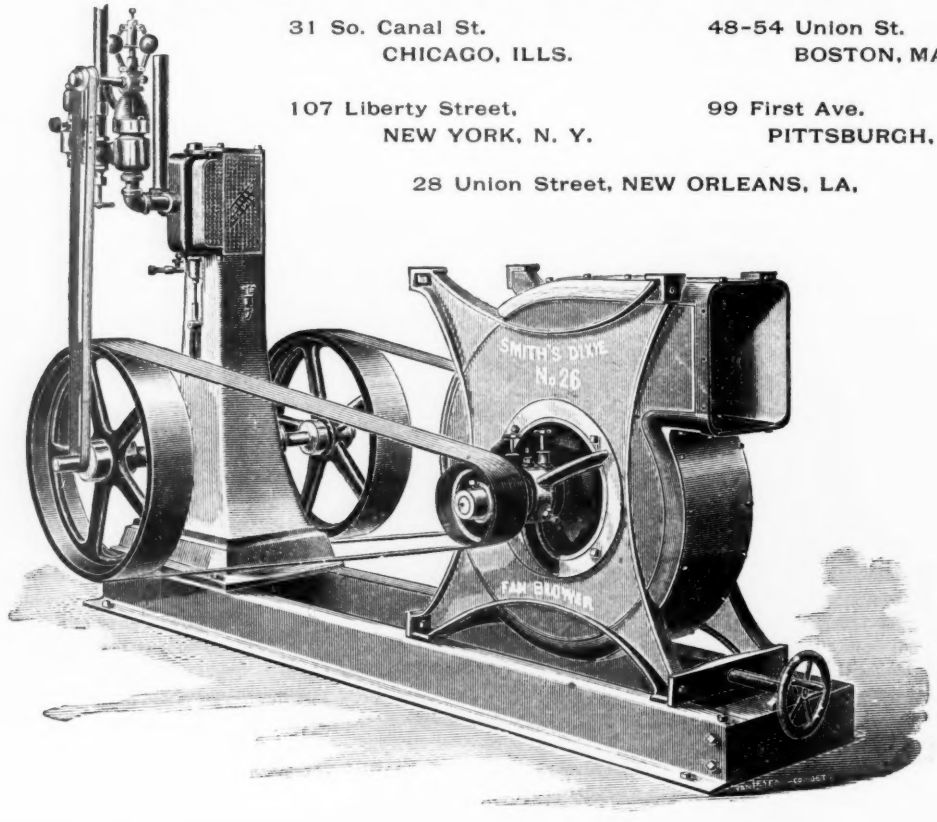

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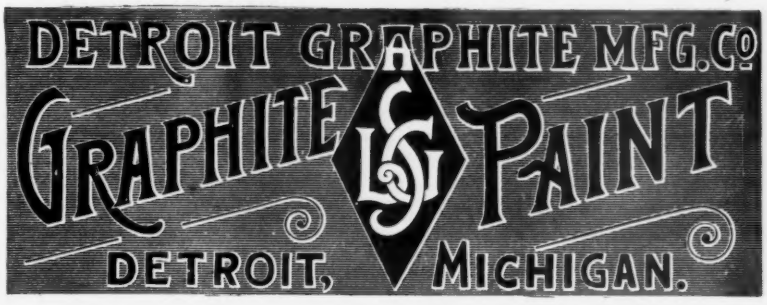

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The great Ivorydale plant of Messrs. Proctor & Gamble is described in 23 colums and illustrated by 57 drawings. The steam plaut at Ivorydale is separately treated in 13 columns and 31 drawings. Other articles in the same field published within the year are: The New Foundry of Henry R. Worthington at Elizabethport, N. J., 16 columns, *26 Illustrations*.

National Meter Company's Foundry and Brass Finishing Shop, Brooklyn, 13 columns, *29 Illustrations*.

Niagara Power Plant (now in process of publication), 6 columns, *6 Illustrations*.

Steam Power Plant of the Dwight Manufacturing Company, Chicopee, Mass., 9 columns, 7 *Illustrations*.

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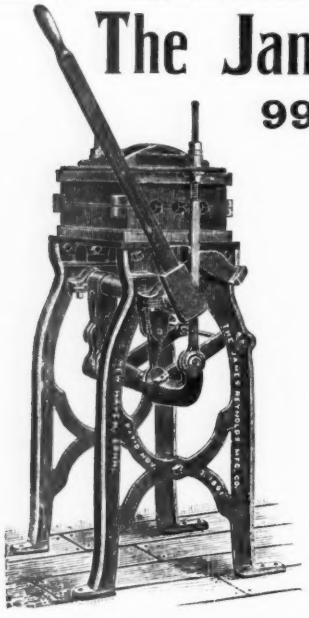

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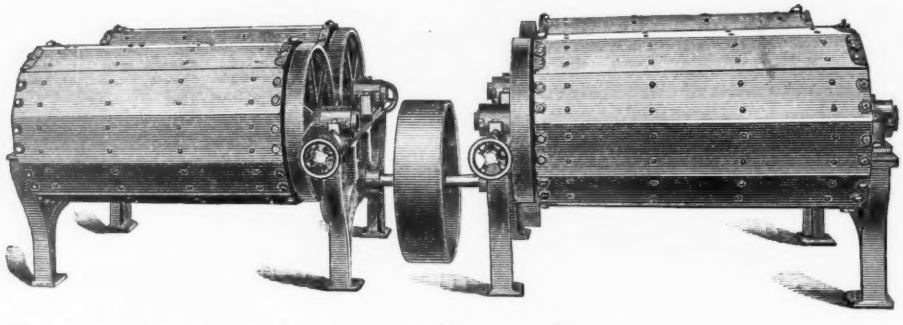

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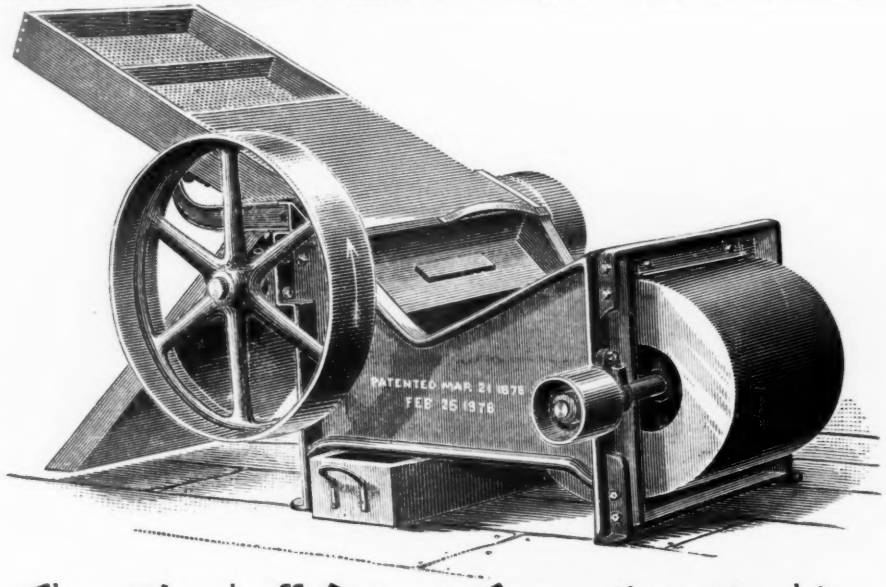

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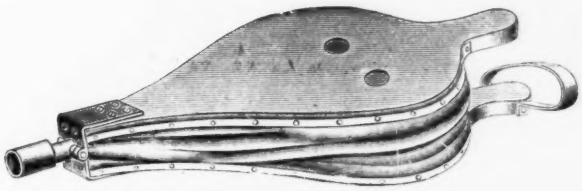

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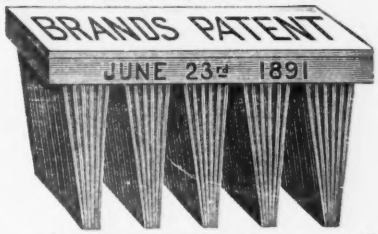

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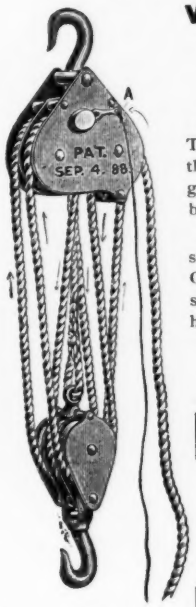

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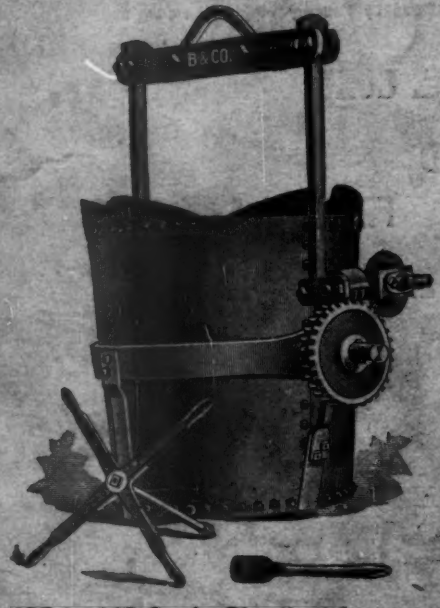

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